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RUN

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May/June 1992
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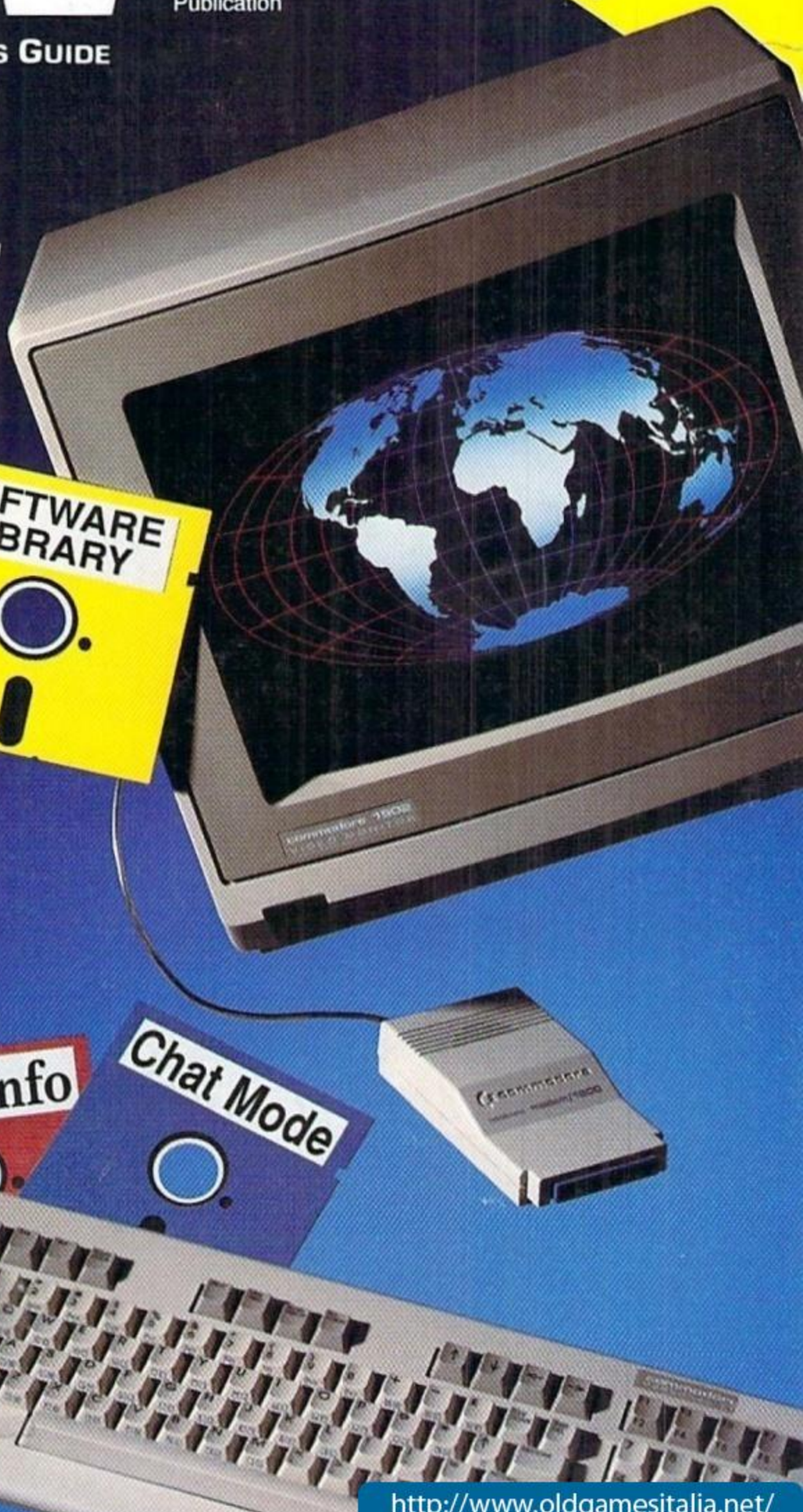

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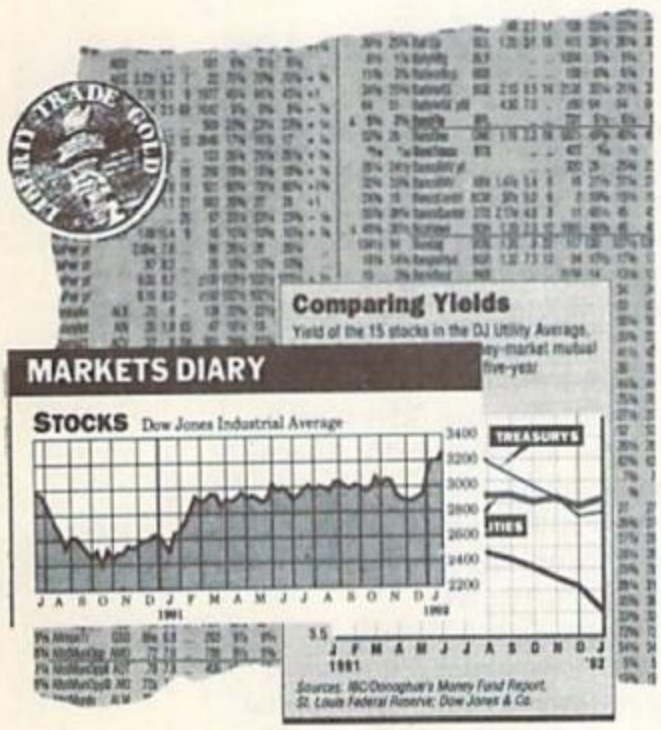
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RUNning Ruminations

Special Products and *RUN*

Like a candidate in search of votes, today's Commodore user is looking for software and hardware to add to his or her system. Product availability—or, more accurately, the lack of it—remains the primary concern of Commodore users, who, as developers move to other markets, envision a computing wasteland of the future.

In response, *RUN* has increased its participation in the development and distribution of products for this market. (How can you *not* notice the eight-page color catalog in each issue?) We've expanded to the point where *RUN* now boasts over 60 catalog items . . . with more on the way.

In the early days of this market, we recognized that there were some software needs not being met by existing developers, and we soon launched our first title: Productivity Pak. The response was tremendous, and with user feedback, we soon developed another disk, and then another. The rest, as they say, is history. We are proud to have played an active role in furthering the Commodore eight-bit market.

In more ways than one, RUN *will continue to do its part to extend the life of the C-64 and C-128.*

In addition to software, we market hardware such as modems and power supplies and, at one point, we sold REUs and some 128D computers.

An estimated 10,000 published titles have been developed for the C-64/128. *RUN* is attempting to bring together users looking for products and some of these titles, which—for one reason or another—companies are no longer interested in marketing.

You'll note that these catalog titles are not fire-sale merchandise. They are top-quality packages, from companies whose titles have become synonymous with quality—for example, Timeworks, Abacus, MicroProse, Berkeley Softworks and Cinemaware.

RUN, as our name implies, will not stand still. As sure as the national debt will rise, we will continue to scout out new and existing products that we think will be of interest to our readers.

At the same time, we remain focused on our first order of business: *RUN*. Our involvement with special products allows us to maintain a symbiotic relationship between the magazine and special products and has enabled us to continue to meet the needs of our readers. The magazine supports and helps generate new product sales, which, in turn, help to finance the magazine. And, of course, *RUN* remains committed to presenting interesting articles, reviews of noteworthy products, high-quality type-ins, and special features, such as contests (see page 30), as well as providing quality products through our catalog.

Though things have changed, it remains an interesting and busy time to be publishing a magazine for the Commodore market. You can count on *RUN* to continue to keep you involved in the Commodore market and to help you get the most out of your Commodore computer system.

Dennis Brisson
Editor-in-Chief

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MAIL RUN

Here are just a few from the hundreds of letters we receive here at RUN *every issue.*

EDUCATIONAL ROLE MODEL

After reading your November/December issue, I decided to write for advice.

The Instituto Anglo Mexicano is a high school (grades 8-12) where we are using Commodore 64 and 128 computers, teaching our younger students to use them as tools for their future studies. Since there is neither the technical support nor the spare parts available for these computers in Mexico, we bought PCs for higher grades.

Through your magazine, we are buying some software and spare parts in order to keep our Commodores working. As we need more computers, I would like you to let me know which computers and software are being used in high schools in the United States. This is a private school and we would like to have our pupils acquire the same level of knowledge as students in American high schools do.

Your assistance will be appreciated.

—LUIS DE LA GARZA MIJARES
TAMPICO, MEXICO

Many computers are used in the United States public and private school systems, including Commodore computers. They continue to be an excellent resource for students at all grade levels. Any readers with information about using Commodore computers in the classroom can write to Señior Mijares:

Instituto Anglo Mexicano
Div. Estudios Superiores
Calle Lopez 601 C. Post. 89260
Col. Campbell
Tampico, TAM
MEXICO

—EDITORS

MORE PERIPHERAL SUPPORT

The January/February issue contained a list of software that supports a mouse, a 1581 disk drive and/or a RAM expander. I offer a couple of comments:

First, you note that Big Blue Reader does not support a RAM expander. I think it does. When you boot BBR, the RAM available in the expander is taken up as part of the transfer buffer—the larger the buffer, the fewer disk swaps necessary. Although BBR does not support copying between the REU and a floppy disk, it does use the REU.

Second, you did not mention CP/M 3.0, the alternative operating system for the C-128. Later versions of DOS support the RAM expander as a RAMdisk, drive M. By using CP/M's batch file commands, you can copy your applications to the RAMdisk from a floppy when booting CP/M, work with the applications at high speed, and then save files to floppy. This also avoids possible corruption of disk files through error or power failure during read/write access.

—KENNETH BUSH
INDIANAPOLIS, IN

Thanks for the clarification. We have had a few other additions to the list. One caller pointed out that PaperClip supports RAM expanders only in 128 mode, and that it will support the 1581 if you configure it as a device 8 dual drive.

—EDITORS

REU FEEDBACK

You have likely received several letters that modify your REU articles of the past few issues. I'd like to note the following:

1) geoRAM will work with non-GEOS programs when connected to RAMLink or RAMDrive.

2) The three-slot expander from Tenex mentioned in the article will not allow simultaneous use of more than one cartridge. Only one cartridge at a time may be accessed. The Aprospand board from Briwall or Quick Brown Boxes lets me simultaneously operate two Quick Brown Boxes and a 1750 REU.

Because most accelerator cartridges are incompatible with the QBB, I have installed the JiffyDOS chips in my computer and disk drive. This provides accelerated disk operations, an expanded DOS wedge and a file copy program.

3) Regarding "Hardware RAMpage" in the January/February issue, it is worth noting that the Write Stuff has been specially adapted to work with RAMLink and RAMDrive. Aside from residing in the device, it creates partitions—useful for those of us who wish to separate our files for different topics.

4) In the same issue you list software that supports mice/1581/REUs. The 1351 mouse works beautifully with the Final Cartridge III.

—JOHN ELLIOTT
TRURO, NOVA SCOTIA

LAY-FLAT MANUALS

Most manufacturers bind their instruction manuals with spiral rings so that you can open them up and lay them flat on your work surface. Some, however, use the old book binding method, which gives the manual a hard spine. These books are troublesome if you have to refer to them often—they keep closing and you have to pin them down with heavy objects.

There is, however, an easy and inexpensive solution to the problem as close as your nearest printing store (such as the Kinkos or PIP chains). I have them add what they call a "combination binding" to the offending manual. The job consists of cutting off the old spine, punching holes in the pages and inserting a plastic spiral. I had expected to lose some text when I first had this done, but instead I ended up with a nice margin on the inside of the page.

I live in a small, somewhat isolated area where prices are usually higher than average, but even so, the entire job cost only $3. For that small amount, I now have a printer manual (among others) that lies flat. I also use different colors to indicate the different applications.

—BILL BARLOW
BAINBRIDGE ISLAND, WA

FUN GRAPHICS MAKES FORMS

Last fall I needed a program to make forms, but I couldn't find a commercial one to do it, and no suppliers could help.

RUN to the rescue!! The November/December issue described two different programs to make forms. But again disappointment—suppliers said one was no longer available and none had heard of Fun Graphics Machine.

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Once again, *RUN* to the rescue!! In Coming Attractions, I read that you were going to feature the Fun Graphics Machine in the March/April issue. Then in the classified section I found an ad for the program. A quick call, priority mail and some really nice people had this program in my hands the next day, and—WOW!!

FGM almost makes graphics and fonts stand out at right angles from the page! The thorough manual and inexpensive keyboard overlay had me—a three-thumbed newcomer—up and running in no time. We soon had a set of forms made up exactly to our specifications.

It can do so many things with different graphics, fonts and border designs, the possibilities for it seem virtually endless. The last print program I bought required the Amiga version for smoothing. Fun Graphics Machine has a smoothing routine built in. It's excellent.

—Dick Kimker
Coos Bay, OR

RUN Amok

We've had a few calls concerning the loading instructions for **Mah Jongg** (January/February). Here's what to do to play this excellent game:

Type in and save Listings 1 and 2, naming them BOOT.MJ and SOURCE.MJ, respectively. Next, load and run SOURCE.MJ; this automatically creates and saves a machine language file named MAJJONGG.ML, which contains the actual game.

To play Mah Jongg, load and run the boot program, BOOT.MJ.

RUN has a new version of MultiCopy that works around a hardware bug in early 1541 disk drives that prevents the program from running correctly. **Multicopy v3.0** will work on all C-64 and C-128 systems. To receive a copy of v3.0, send a blank disk and a self-addressed, stamped disk mailer to *RUN* Magazine, Multicopy v3.0, 80 Elm St., Peterborough, NH 03458.

NOTE: The Multicopy programs will not run with a cartridge or printer interface plugged into the computer.

Steve Karstensen deserves special acknowledgement for submitting 11 entries to *RUN*'s literary contest. His name was omitted in our March/April issue. Hats off to you, Steve.

The instructions to ***RUN*'s Checksum** have been modified to make them easier to understand. The Checksum program, however, has not changed.

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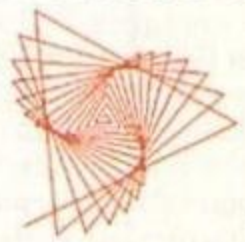

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Answers to the most important questions asked by newcomers to telecommunications.

Online

By JOHN RYAN

The enemy cybernetic tank slowly emerges from around the corner and moves unwittingly into my line of sight. I think to myself, "Hah! The fool. He doesn't even know I'm here!" Carefully, I swing my turret toward the intruder and align my gun sights. He still doesn't see me. Too bad—he'll never know what hit him. Depressing my joystick button, both barrels seem to explode as I let loose two rounds of high explosive shells. The enemy is history. Game over.

I'm not describing a game between me and the computer, nor am I playing against a buddy who's plugged into the next joystick port. The enemy tank I destroyed was controlled by a friend who lives over 50 miles away. You see, I'm a telecommunicator; I own a modem.

Exploring the world of telecommunications is an exciting and affordable way to exceed the limits of your disk drive, to move beyond the boundaries of memory and model. When you have a modem you can exceed the capabilities of your Commodore computer without leaving the comfort of your desk chair.

Perhaps you have thought about purchasing a modem, but didn't know where to start. Perhaps you've just purchased your computer and know nothing about telecommunicating. Don't worry. As a telecommunicator I can show you how to increase your productivity, acquire free software and chat with like-minded people all across the continent.

In today's high-tech world, we have little excuse for failing to communicate—especially us Commodore owners. By asking a few basic questions, you can learn just about everything you need to know to get started.

1. What Is a Modem?

Obviously, you can't just plug your telephone line into the computer and dial. You first have to own a device that will translate the computer language into a form that can be transmitted over phone lines: the modem. It lets your computer talk to other computers over simple telephone lines. It modulates the computer's binary language into an analog signal that can be sent through telephone lines. Once this signal reaches the destination computer, the modem demodulates the analog signal back into its binary form and feeds it into the computer. MO-DEM: MOdulator/DEModulator.

Think of an American and Russian trying to converse with one another. First the American speaks. An interpreter translates the English into Russian. When the Russian responds, the interpreter translates back into English. A modem acts in the exact same way, translating the computer's binary language into the telephone's analog language. Simple, right?

Modems can send and receive information at different speeds, called baud rates. Simply put, a modem is rated on how many bits per second (BPS) it can send and receive. Most Commodore owners have modems rated at either 300 or 1200 BPS.

Although it costs very little, the Commodore 1660 300-baud modem is a poor choice if you plan to communicate long distance. At 300 baud, sending and receiving information will be s-l-o-w, racking up painful long distance bills. (At 300 baud you can actually watch text scroll onto the screen word-by-word.)

The Commodore 1670 1200-baud modem is a perfect choice for the novice telecommunicator. It's reasonably priced and works four times faster than the 1660. (See "How Swiftly Will It Go?" on the facing page for information on super high-speed transmission.)

2. How Do I Control a Modem?

Almost all modems come with a *terminal* program. You may recognize this as a word that many of us use to describe a computer's monitor. Back in the early days of computing, a terminal was simply a monitor and keyboard hooked up to a mainframe computer. A terminal was a "dumb" device that relied on the mainframe computer—usually connected to the terminal by simple telephone or serial lines. Today's terminal program makes your C-64 act like the dumb terminals of yesteryear. It takes control of the computer and regulates the input and output of the modem for you.

Terminal programs contain many features to automate your telecommunicating tasks. Almost all have a phone book, which you personalize with the numbers of bulletin board systems, friends or services that you want to call most often. You simply select a number and the terminal automatically dials, waits for the other computer's modem to answer, then connects you.

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Solutions

Let's say that your friend across town owns a modem and you want to call him and chat using your computer. In other words, what you type will appear on his screen and vice-versa. You'd simply select his number from the terminal's phone book, wait for the Ring and Connect messages, then type away.

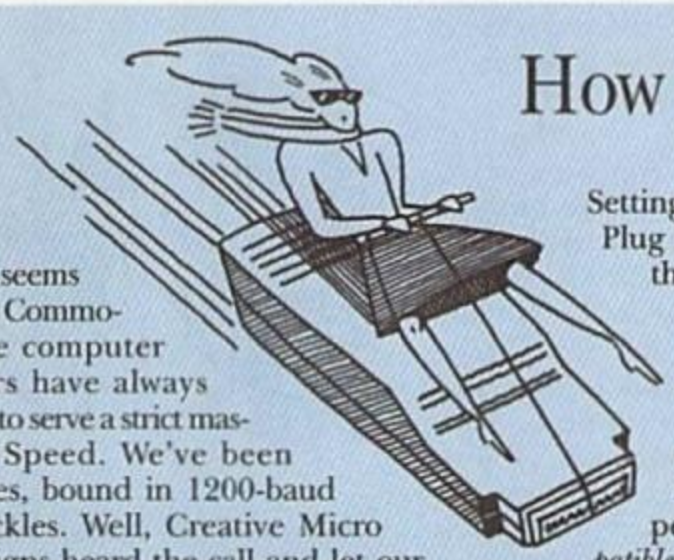
Terminal programs also contain features to make your time online more productive. Most have capture buffers that can quickly receive huge amounts of text, which you can save to disk for later review. Likewise, all terminal programs let you receive files from other computers (download) or send files to them (upload).

Some popular games have terminal programs built right in. If you and a friend own a game that supports modem play, you can actually have the game "call" your challenger so that you can play each other remotely. One tip: Remote game play is best at speeds of 1200 baud or higher.

3. What Can I Use the Modem For?

You name it. I've already touched on a couple of uses: You can chat, swap programs online, play games, all sorts of stuff. There are also hundreds of bulletin board systems (BBSs) throughout the continent for Commodore computers. Chances are there are one or several in your area. (For more information, see "BBS Finesse," p. 13.)

How would you like to shop, do research, get news, ►



How Swiftly Will It Go?

It seems that Commodore computer users have always had to serve a strict master: Speed. We've been slaves, bound in 1200-baud shackles. Well, Creative Micro Designs heard the call and let our people go: The SwiftLink-232 serial cartridge is the great baud liberator.

SwiftLink is an RS-232 serial interface cartridge that plugs into the back of your computer, letting it communicate with other RS-232 serial devices, including printers and modems. In other words, with this cartridge you can go out and buy an IBM-compatible modem and plug it directly into your C-64.

What's the benefit, you ask? How does reaching baud rates up to 38,400 sound? Some national networks, such as GEnie, charge the same for 1200- or 2400-baud access, so stepping up to a high-speed modem makes sense for two reasons: It's economical and productive.

Setting up the cartridge is a snap. Plug it into the expansion port, then connect the serial cable to the cartridge and to your modem. That's it. You're ready to go.

The serial cable you need will depend on which type of modem you own. For most people who own *Hayes -compatible* modems, you'll need a DB-9 female to DB-25 male serial cable. (The SwiftLink cartridge has a DB-9 male connector.) These cables are relatively inexpensive, running from $10 to $16 at Radio Shack and other computer equipment stores.

Not all Commodore-specific terminal programs support speeds over 1200 BPS. Not to worry. Included with the SwiftLink cartridge are several excellent terminal programs for the C-64, C-128 and even CP/M systems.

Desterm128 v2.0 is perhaps the best C-128 terminal I've ever used. It's fast, good-looking and offers just about every option you'd ever need—phone books; buffer swap, save, and load; programmable function keys; and a myriad of different protocols.

Novaterm 91 is the C-64 terminal program developed to work with high-speed modems. It, too, is loaded with features, including a simulated 80-Column mode, script support and enough protocols to keep even the fussiest user happy. Qterm v4.29, the CP/M terminal program, also is included in the package.

I tested SwiftLink using my own Hayes-compatible Supra 2400-baud modem. The cartridge performed flawlessly as I dialed into GEnie with Desterm and, for the first time ever, received a CONNECT 2400 message on my C-128's 80-Column screen. (I haven't yet tested the new 9600 MPN5/v.32 modems, but I can't wait!)

How fast will it go? Since the SwiftLink is an industry-standard RS-232 interface, it can reach speeds up to 38,400 baud. CMD offers a 90-day limited warranty on the cartridge and full-featured support in its forums on Q-Link and GEnie. □

—JR

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play games and download thousands of programs—*without leaving your chair?* Then check out one of the many national information networks such as QuantumLink, GEnie or CompuServe. (See "Network News," page 11.)

When you download a file from a BBS or network, it goes directly onto your disk. When you hang up, you can exit the terminal program and load your new file. Acquiring good software has never been so easy.

4. What Do I Need to Get Started?

This is the easiest question of all. Since you're reading this article, chances are you already have made two of the biggest investments—a computer system and your interest. You're also going to need a telephone and a modem. Touch-tone phones are ideal. Rotary phones (pulse) will work, but are slower when dialing.

If you plan to use your modem a lot and have call-waiting service on your telephone, you may want to cancel it. Call-waiting temporarily interrupts the signal that the modem uses to maintain its line connection. If you're online, a call-waiting signal will usually disconnect you. (It only takes a few disconnects to try my patience.) Some areas, however, have punch-in codes that will temporarily suspend the call-waiting service.

When selecting which modem to buy, consider your needs and your budget. You can still find 300-baud modems for as little as $10 through magazine advertisements. The 1670 modem (1200 BPS), a very good buy, sells for as little as $25. I would recommend the 1670 to anyone who's just starting out. The money you'd save buying the 300-baud modem would soon be eaten up by other charges and aggravation.

Selecting a terminal program is ultimately a matter of personal taste, but, of course, you need to start somewhere. The 1670 modem comes with a terminal program called Common Sense. While it's not the best terminal in the world, it's enough to get you started.

Later you can choose a more elaborate terminal from the wide variety of packages available. (See the box below for popular commercial terminal programs.) Don't be surprised, though, if you find that you like a public domain or shareware terminal better than its commercial counterpart. Be sure to check out all of your options.

One final note: Some networks (such as Q-Link) provide their own specialized terminal programs as part of the subscription.

5. Can I Talk to an IBM?

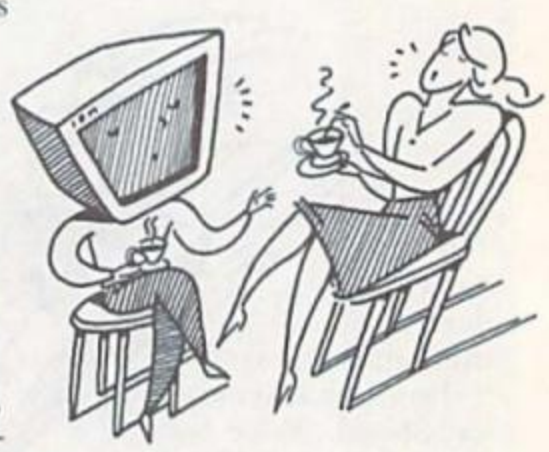
Just about all computers can talk to one another over telephone lines. Whether you're calling an Atari, IBM or Apple, your modem will act as universal translator, letting you chat with any computer you'd like.

This doesn't mean, however, that you can download programs from other computers and expect them to run on your Commodore. While a modem can receive files from any computer model, it is not an emulator. Only text files (sequential or ASCII) can cross the computer platform boundaries. For example, you can download a news story from CompuServe and load it into a Commodore word processor, even if the file was created with an IBM. But, you cannot download an IBM word processor program and run it on the Commodore.

GEOS users should note that all GEOS files must be converted to ASCII before they can be uploaded. Likewise, GEOS files that have been downloaded must be converted back to GEOS format before they can be used. Several utility programs can handle the task, including geoTerm II and Convert 2.5.

Other file types, including graphics files, can be used among the different computer platforms, but they must be converted with special utility programs. (For more on converting various files from one platform to another, see our September/October 1991 cover story.)

Finding the software shelf a bit bare lately? Rest easy. Even as fewer and fewer commercial packages make it to the marketplace, thousands of programs are available in the public domain. There has never been a better time for Commodore owners to get online. And, once you've purchased the modem, access to local BBSs is usually free. (Of course, long-distance and network services do charge fees.)



So plug in, dial up and get on-line. There's always something good happening on the other end. ■

John Ryan has written many articles and reviews for RUN *on all aspects of Commodore computing.*

Check Out These Terminal Programs

Every on-liner has a favorite terminal program. Following are several of the most popular. Each offers a wide range of transfer rates, protocols and features:

BellTerm C-64 by Ed Bell ($29.95/Parsec Inc., PO Box 111, Salem, MA 01970)

Dialog 128 ($49.95 US/$59.95 Canadian/Shining Star Software, #1205-1640 Bayview Ave., Toronto, ONT, Canada M4G 4E9)

RUN Term 64 and **128** (Available on Super Starter Pak. See *RUN*'s catalog in this issue for information.)

geoTerm II (available on GEOS Power Pak II. See *RUN*'s catalog in this issue for information.)

—EDITORS

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Network News

Whether you prefer to tune in at primetime or in the wee hours, there's always something happening on the telecommunications networks.

By TIM WALSH

I frequently receive phone calls and letters from people eager to use their Commodores on one of the major telecommunications networks. In most cases they've already earned their stripes as modem manipulators. They've connected their modems and, with disproportionate amounts of frustration and success, they've managed to get online with the help of a terminal program or two.

Most online computerists make a local bulletin board service their first stop. (See "BBS Finesse," p. 13.) But within a month or so, many enthusiasts outgrow their circle of local BBSs. For them, the next logical move is to a large network. While BBSs are a great source of Commodore files and valuable contacts, no BBS could possibly match the wide array of goods, services and social events offered by any major network.

If you've been around the computer scene for any time at all, you've heard all about the virtues of the computer networks (called "the nets" by those in the know). But nobody tells you what you get for the money you pay. Which one delivers the most for the money? Most computerists don't know.

Local Help

Of all the free advice I've doled out over the years about the nets, the most important tidbit remains unchanged: Your best choice is selecting the one that is least expensive to you. With high connect rates, hidden costs and research areas that make pay-per-view seem like a bargain, network expenses can stack up at a frightening rate if you're not careful.

With the possible exception of those who log on to the nets from their luxury yachts, everyone worries about finances. To curb expenses, the best rule of thumb in the network selection process is: Choose one that doesn't require a long distance call. While common sense dictates logging on when rates are low and using the fastest modem your computer can support, it's still long distance calls that make the nets prohibitively expensive.

When you call a network, you're actually calling a node, a service providing local access to a network that may be thousands of miles away. Tracking down a local node, such as a local Tymnet or Telenet number, may not be a problem in metropolitan areas, but in rural and remote areas it can be difficult. You may not even be able to find a node within your local calling area. In such cases, I recommend finding the node that is in the least expensive calling area. Usually, that means selecting the closest node. If that node supports two or more networks, say, Q-Link and GEnie, simply choose the net that costs less. (Ironically, it is occasionally less expensive to call out of state than to call a nearby city. Check with the telephone company for rates.)

One case study of small town telecommunications is here in the home of *RUN* magazine, Peterborough, New Hampshire, where rush hour means eight cars waiting at the town's one stoplight. Peterborough is a classic example: Unless you choose QuantumLink, CompuServe or BIX (Byte Information Exchange), which have local nodes here, you will have to pay steep long-distance tolls to a nearby city.

Life Beyond Computers

All networks are basically created equal when it comes to basic features, such as their selection of public domain Commodore files, the ability to send and receive e-mail, and so on. Q-Link possibly has the edge when it comes to Commodore-specific files, thanks in large part to its pure Commodore dedication over the years, and to its friendly system that welcomes newcomers with easy, one-finger menu selections. Q-Link also remains the best choice for users who are testing the network waters with their Commodore. So, if you're a die-hard Commodore 8-bit user with little interest in other online activities, Q-Link is probably all you need.

On the other hand, if you view networks as more than just a Commodore file clearinghouse, then you should consider other nets, such as GEnie and CompuServe. One of the best-kept secrets of these heavy-hitting networks is their unlimited potential for expanding the horizons of computer enthusiasts and non-enthusiasts alike.

Armed with massive data files, research, educational and financial areas, plus hundreds of special interest groups (SIGs), both GEnie and CompuServe make Q-Link appear downright limited. Their resources are so expansive that few network subscribers, including those with years of membership under their belts, have fully explored the options offered by either one.

What follows is a brief look at QuantumLink, GEnie and CompuServe, the three nets attracting the most ►

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Commodore subscribers, including some of their alternative services that may make them more attractive to some users.

Exclusive And Economical: QuantumLink

As I mentioned earlier, Q-Link is still regarded as one of the most useful networks for Commodore users. It remains 100 percent dedicated to Commodore 8-bits, with its own C-64 terminal program, which you must have in order to log on. While Commodore support has waned dramatically in recent years, QuantumLink remains a viable network for those interested in obtaining software, sharing files and making contacts with other 8-bit users.

Q-Link's terminal program has been both praised and criticized: Praised because it is easy to use, and because you need only configure it once for your system; criticized because you can't log on to the network without it. If you misplace or wear out the Q-Link disk, forget about logging on until you get a replacement.

What can you do online with Q-Link? Shop, socialize, visit conferences and attend college-level classes on a variety of subjects. You can also read frequently updated national and world news and weather reports.

One of the most compelling reasons to join Q-Link is that forums are held on a regular basis by Commodore personalities. You can learn the finer points of Basic and machine language programming from some of the best in the business. Experts from companies such as Creative Micro Design and *RUN* hold topical forums each month. (That's right, on the last Thursday of every month, Q-Link members can meet up with the editors of *RUN* in a friendly candid conference.)

When it comes to cost, Q-Link is attractive to all but the tightest budgets. For $9.95 per month, you can become a Q-Link subscriber. In addition, you must pay a charge of eight cents per minute for downloading a file, plus an additional $1.50 to download certain "premium" files, such as those in the *RUN* Premium library.

Not Just for Commodore Users: GEnie

One of my favorite networks, GEnie has grown into a wonderful resource center for thousands of Commodore users. With its numerous subscribers and services, GEnie dwarfs QuantumLink. GEnie offers great Commodore support in the Flagship Commodore RoundTable (type "CBM" at any menu), but it attracts computer users from all platforms, IBM, Apple, you name it. From shopping to an online motorcycle club, GEnie seems to have everything.

Like QuantumLink, GEnie offers shopping and socializing, but on a far larger scale. Sure, there are news and weather updates, but GEnie goes beyond with hourly updates on Dow Jones stock prices and news bulletins. GEnie offers RoundTables (equivalent to Q-Link's SIGs) on such diverse subjects as photography, medicine and even law enforcement.

Instead of a few attendees in select conferences and a handful of regulars in chat areas, GEnie RoundTables attract huge numbers of participants. The Writer's Ink RoundTable (type "WRITERS" at any menu prompt), for instance, is regularly attended by experts, enthusiasts and amateurs alike. GEnie subscribers are not merely computer enthusiasts, they're interested in all sorts of subjects.

If you're hoping to go back to school some day, think about getting your education on GEnie. GEnie's Computer Aided Learning Center is frequently overbooked with students wanting to get training and college degrees online. Sign up early (type "CALC") if you're interested.

And, although it is not the least expensive network, GEnie is quite reasonable. You have access to over 100 basic services for just $4.95 per month. Listing areas and RoundTables cost $6 per hour to attend at any speed up to 2400 baud during nonprimetime hours (6 P.M. to 8 A.M.).

The Empire of Networks: CompuServe

CompuServe is a huge, wondrous network on a scale that is difficult to comprehend. There are almost 750,000 members and 1500 databases. Of course, CompuServe features a wide variety of staples including shopping, up-to-the minute news, financial services and educational reference databases. But what makes it unique is that it also offers special interest forums on topics you wouldn't expect to find on any computer network.

Recently I have had occasion to visit the SIGs, special areas, and conferences available on CompuServe. I've found that it offers not only the standard services, but also some that are bizarre enough to raise even the jaded brow of Geraldo Rivera. From astrology and out-of-body experiences to stock market analysis and wine tasting, I think CompuServe has it all. (Maybe *this* is where Geraldo finds his guests.)

Some airline crews use CompuServe to get their flight schedules. On more than one occasion I've received calls from flight attendants and pilots wanting to use their Commodores to get on CompuServe. (Not surprisingly, it's a great place to order airline tickets!)

Moving about the countless areas on CompuServe is easy. Just type the name of the area, preceded by a "GO" command, such as "GO CBM," which will take you to the Commodore area. Once there, you'll find long lists of freely distributable programs, graphics and utilities.

This is a huge network. It is certain to offer something about anything you could want to explore. But, as with anything, there is a price for this diversity. Undoubtedly, it is more expensive than the others. Even so, CompuServe is attractive for hundreds of thousands of computerists (particularly when they can find a local node!). You're billed $2 per month, plus $12.80 per hour for 1200- and 2400-baud connections, or $6 per hour for 300-baud connections. (Rates apply 24 hours-a-day.) ■

Among other things, Tim Walsh has been RUN's *telecommunications ace for longer than he cares to admit (or remember). One of his many hats is that of* RUN's *Technical Manager.*

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800-848-8199

GEnie
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Rockville, MD 20850
800-638-9636

QuantumLink
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Vienna, VA 22182
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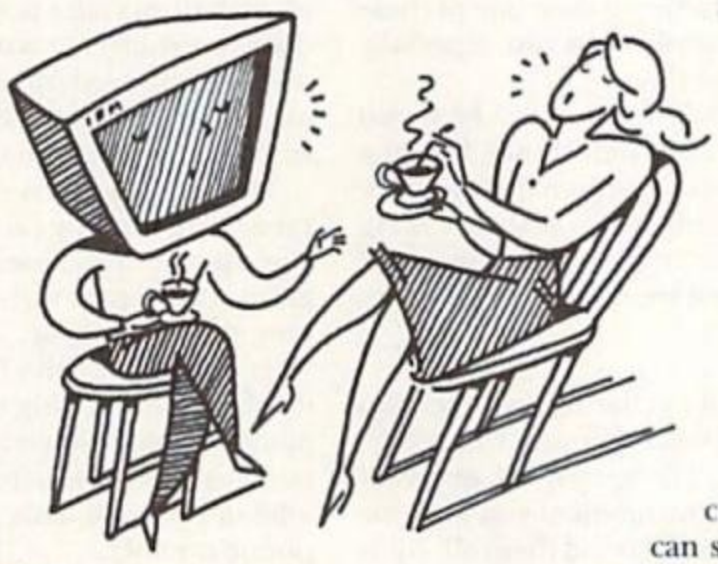
BBS Finesse

Bulletin board basics, grassroots networks and anarchy on the phone lines.

By STÉPHANE DIRSCHAUER

A confession of sorts: In the past five years, I've logged almost 2000 hours telecommunicating. Yet in all that time, only about 120 minutes have been spent on major networks like QuantumLink and GEnie. Instead, I've devoted my online time to small bulletin board systems.



So what gives? Am I cheap? Am I *sick*? With all due respect to my colleague Tim Walsh, I simply prefer the homey BBS atmosphere.

Frankly, if you spend all of your online time using large services like QuantumLink and CompuServe, you're definitely neglecting one of the most delightful options available to a modem-equipped computer user. While the big boys of telecommunications may have more features and files than you could ever exhaust, BBSs have a few special attributes of their own.

In The Beginning

Several years ago, admittedly, there was less reason to be so bullish about BBSs. When a system operator, called the *sysop*, decided to set up a system, there were few options. The bulletin board software that ran the whole thing was about as flexible and interactive as its cork-and-thumbtack namesake. And, since BBSs were technically rather difficult to start, most sysops were (by default) computer experts who reserved much of the board to computer-related discussions only. Yawn! I, for one, love my computer, but I think we all can use some variety.

Thank the computer gods that there are now, without exaggeration, hundreds of BBS programs, with at least a few dozen made specifically for the C-64. Many offer such sophisticated options as full-screen editing, networking, and online games. What's more, with a ready supply of bug-free BBS software (and some of today's economical hardware), more and more people are operating BBSs, even relative computer neophytes. As a result, BBSs cover a much wider range of interests. There are BBSs dedicated to discussions of music, sports, literature, the environment, genealogy and on and on.

Although the features a BBS offers will vary with the system software, most offer the following:

Messages. In this aspect a BBS is a public forum. Using the BBS text editor, you can send a public or private message to another user, or simply address the message to "ALL." Messages are usually classified by subject, and you can scan for your particular interests. Users jump into the conversation with comments and replies to previous messages giving the message forum a stream-of-consciousness feel.

Uploading and Downloading. Although they'll never be able to compete with major nets in quantity, most BBSs do carry text and program files you can download with your terminal program. The number of files available depends on the BBS's disk space, which, today, is likely to be at least a few megabytes. You can also upload your own files to the BBS.

Bulletins. The bulletin section of a BBS, where users can read text files online, is often the most neglected one. Some sysops just don't put up anything more interesting than a copy of the BBS's rules and a BBS list. I've a soft spot in my heart, though, for bulletin sections like NOVAC's, which offers updates on NASA missions.

Games. BBS programs often have "door" options letting you access programs remotely while using the board. Most doors are games, and they can get complex. Systems using certain IBM BBS programs, for example, often run a popular multiple-player adventure game named TradeWars. Since few BBSs have more than one phone line, the games are played in turns consisting of several dozen moves. Even so, the addition of a few other human players can really liven things up.

Netmail and Echomail. Contrary to what network users would have you believe, BBSs are not merely tiny isolationist blips on Ma Bell's map. In the last few years ►

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sysops have been stringing BBSs together into a veritable telecommunication Christmas tree. Many BBSs now belong to at least one inter-BBS network, which lets you share messages with the users of the other participating BBSs around the continent and even around the world.

The nicest (free) networking perk is the echomail conference.These are message areas where you can read and write messages that will go to every BBS linked to yours on the net. The immediacy of these discussions sometimes leads message-posters to forget that their comments are carried throughout the continent (or the world), and they'll make board-specific comments ("There's a new file in the download section . . .") that elicit puzzled replies from dozens of people around the net. (It's kind of funny, in an obnoxious sort of way.)

Echomail conferences also make it possible to establish discussions on topics that couldn't form a large enough audience locally. Looking at the list of conferences on NorthAmeriNet under C, for example, I see, among others, areas devoted to CAD, Chess, Comedy, Comics, CP/M, and Construction. Intelec, another network, offers Compression, Consumer and Cooking.

You can send private mail (netmail) over one of these grassroot networks, but it'll probably cost you, especially if the addressee's BBS is out of town.

I have to admit that all of these features can be found on the larger systems. But to my mind, they lack the more comfortable atmosphere of a personally-run BBS. It's the difference between having lunch at the local Pig & Whistle and dining *en masse* in a giant cafeteria. Of course, there's also the fact that most BBSs are free.

Getting In

So you're all excited, you pull out the Yellow Pages, flip to B for Bulletin, and . . . *nothing*. You won't find BBS numbers in the phone book. The search for numbers isn't difficult, though, because the moment you find one working number, you've essentially found them all. BBSs carry lists of other BBSs, and, in turn, the systems in those lists carry other lists.

To find that first number, you can check with the computer store where you bought your modem. Often they make a small list available, or even operate their own system for customers. If that doesn't work, you may want to call one of the systems listed below to get you started.

Whenever you try a number for the first time, though, be ready to quickly switch to voice should your modem suddenly broadcast the irate voice of an ex-sysop or the new occupants of a sysop's former home. At least a third of BBSs are in the process of going up or down at any given time, and even established systems will occasionally change numbers, making most BBS lists hopelessly inaccurate just a year after they were compiled.

Once you see your modem's Connect message, you'll see the BBS's welcome screen (if not, tap the RETURN key a few times to show the BBS that you're ready). There's a chance you'll be asked if you want color graphics text. The answer depends on a few things. If it's a C-64/128 BBS, and your terminal program can handle PETSCII color/graphics, choosing that option will send your text in color using the full Commodore character set.

Do *not* select this option on IBM, Amiga or Macintosh BBSs unless the program specifies Commodore color graphics or PETSCII. The usual option on these boards is the American National Standards Institute's (ANSI's) set of control codes to change colors, clear the screen or display certain characters. You can still read the text, but it will be jumbled up with control codes. (If you want to use ANSI, check your BBS's download section for a public domain/shareware terminal that can handle it.)

The final choice is ASCII, the mode most BBSs use, even those running on C-64s and 128s. It's plain, monochrome text. If you use the Common Sense terminal program that comes with the 1670 modem, ASCII is the only choice available.

As soon as the BBS has settled that question, and has displayed its opening screen (some of these screens are painfully long), you'll be asked for your name or handle (an on-screen alias), and, because you're a new user, for a bit of personal data, including your address and telephone number.

There's also the matter of selecting a password to identify yourself when making future calls. Unfortunately, many BBSers show little imagination. When I once operated a system, I was amazed at the passwords some people used: their first names, the first few letters of the

A Few BBS Numbers

These special interest bulletin boards show the diversity that BBSs cover. These numbers will get you started if you've never logged on before, or they can round out your growing list.

At the time this article was prepared, each of these BBSs was operating at the number listed 24 hours a day and could handle baud rates of 2400 or higher.

BBS name	Interest	Number
Florida Archaeology	Archaeology	904-488-6186
Esperanto	Esperanto universal language	416-731-2667
The Dead Board	Grateful Dead music	717-677-9573
Psychology Online	Psychology	404-390-0292
NIST BBS	National Institute of Standards and Technology, computer security	301-948-5717 and 301-948-5140
International Collector's Network	Collecting	213-204-0646
NOVAC BBS	Astronomy	703-256-4777
Railnet	Railroad Hobbyists	216-883-6298
The Black Bag BBS	Medicine	302-994-3772
FDA/CDRH Guidelines	FDA Guidelines	303-443-7496

—SD

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alphabet, and even (ugh!) "password." Be sure, also, to use a different password on each system you use.

Once you've given all the necessary information, you're logged onto the board with time to browse through the system. Most BBSs do not grant you full access until the sysop can validate your account.

Using a BBS is relatively easy. They typically offer a list of commands automatically, or once you enter a question mark followed by a carriage return. Some BBS system software, like Ed Parry's superb EBBS 128, uses hotkeys, so you only have to press the question mark key and the BBS will bring up its help files.

When you're done, don't just hang up. Use the BBS's Goodbye or Quit command to ensure that your account is properly updated. In the past, some BBSs would crash if the user just hung up. That's no longer true, but leaving so abruptly could create a few irregularities in your user file, so that the BBS thinks you were on longer than you really were, or that you didn't call at all, which means that you won't be able to do things like read all the messages posted since your last log-on.

Chances are, though, that once you try out a few BBSs, you'll be more eager to log on than to log off! ■

Stéphane Dirschauer of Toronto makes frequent contact with the rest of the world with his Commodore and a modem.

List Your BBS in RUN

Attention BBS sysops! You can have your bulletin board system listed in *RUN*'s Commodore 64/128 BBS list in an upcoming issue. To be eligible for listing, your BBS must have been operating 24 hours a day, 7 days a week, since December 1, 1991 or before, and must offer C-64/128-specific support.

To have your BBS listed simply send the following information:

- BBS name
- Telephone number(s) and location
- Available baud rates and transmission codes (ASCII, PET-SCII, etc.)
- BBS system software title
- A brief description (roughly 20 words)
- Sysop's name, address and telephone number
- The date the system began operation
- A user name and password that I can use to log on and verify the information provided).

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Traverse

This action arcade game will drive you crazy in minutes, and keep you entertained for hours.

By TONY BRANTNER

Traverse combines features of Pac Man and Pinball, with unique twists of its own. Like Pac Man, it's a travel-the-path-and-eat-the-dots game, each level being a maze with dots along the paths. Unlike Pac Man, however, you don't direct the ball with traditional joystick commands. Instead, your joystick controls yellow flippers at each intersection in the maze.

Press the fire-button to start, then guide the ball across all of the dots, making them disappear. Pressing your joystick in the eight possible directions will make your ball deflect right, left, continue straight or bounce back when it hits the intersection. You'll need to experiment with the controls during your first game to get the hang of it. To pause the game, press the SHIFT-LOCK key.

A game consists of three turns, and for each turn a timer counts down to zero. The timer counts down from 100 at level one, from 96 at level two and so on. At the higher levels, the ball also rolls faster. When you collect all the dots you advance to the next level. In level one, you earn one point for each dot you eat, in level two you earn two points, and so on. Clear a level, and you get a 1000 point bonus. Earn 10,000 points, and you win an extra turn. The turn ends when you run out of time or lose the ball.

Out of Control

So far, so good. The hazards you find scattered along the paths, however, can quickly confound you! Spinners—the only permanent hazards—send the ball off in random directions. The other hazards turn off and on every few seconds. U-shaped magnets hold the ball until the hazards disappear. Round bumpers reverse the ball's direction. Diamond-shaped teleporters zap the ball to one of the spinners. Purple squares take the ball and end your turn.

Type in Traverse from Listing 1, using *RUN*'s Checksum program on page 33, and then save it to disk with the name TRAVERSE.SC. Run the program once to create TRAVERSE.ML. To play, load and run TRAVERSE.ML using the command LOAD "TRAVERSE.ML,8,1". R

Tony Brantner is a carpenter, and RUN's *premier action game programmer.*

Listing 1. Traverse.SC program. (Also available on the May/June ReRUN disk. To order, call 800-824-5499.)

```
0 REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) TRAVERS
  E.ML                    :REM*72
5 OPEN 8,8,8,"TRAVERSE.ML,P,W"
                          :REM*185
6 CT=0:PRINT"{SHFT CLR}":REM*56
10 READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                       :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1         :REM*141
15 IF LEN(A$)<62 THEN 55
                          :REM*254
20 B$=MID$(A$,1,20)+MID$(A$,22,
  20)+MID$(A$,43,20)      :REM*242
25 FOR I=1 TO 30          :REM*181
30 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*209
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*85
40 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
50 NEXT:GOTO 10           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 70                    :REM*184
60 IF LEN(A$)<42 THEN B$=LEFT$(
  A$,20)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 70              :REM*176
65 B$=LEFT$(A$,20)+MID$(A$,22,2
  0)+RIGHT$(A$,LEN(A$)-42)
                          :REM*140
70 FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*140
80 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*84
90 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 10           :REM*160
100 REM                   :REM*243
101 DATA 0108080800A009E323036*3
  1000000203B0DA900A0*3F994000
  38810FAA207A0           :REM*22
102 DATA 00BD2B109940003C8C8C8*C
  A10F4A9008D17D08D1B*D08D1CD
  08D1DD0A9018D           :REM*86
103 DATA 27D0A90D8DF80778A986*8
  D1403A90D8D150358A9*0F8D20D
  08D21D0A9008D           :REM*109
104 DATA 22D0A97FA00E201EABA2*1
  7A002182F0FFA90BA0*0F201EA
  B20460BA918D            :REM*39
105 DATA 8610A9032C900AD8610*2
  0510B8EC8078CC9078D*CA07A90
  08D8A108D8B10           :REM*207
106 DATA 20B50B2036CA900A899*8
  C10C8D0FAAD86100A0A*8502 38A
  968E5028D9110           :REM*119
107 DATA 20EB0A20A60A20FE0BA9*0
  18D15D0A961A00F20CB*0B20E1F
  FD0010 0AD8D02          :REM*56
108 DATA 2918D9510D0F6206C0B*E
  E9510208509A9008D95*102 0FE0
  BAD8A100D8B10           :REM*53
109 DATA F00BAD9110F03F20D90A*4
  CC8082 0B50BA9048D0C*D4A9288
  D08D4A9328504           :REM*109
110 DATA A2108E0BD4E88E0BD4A2*1
  420FB0AA9032 0C30BC6*04D0E9A
  C8610C8C00BB0           :REM*176
111 DATA 038C86102011 0C4C7E08*2
  0B50BA99C8D0CD4A900*8504A50
  40A8502 38A90A          :REM*106
112 DATA E5028D08D4A2208E0BD4*E
  88E0BD4A5040A0A1869*3220C30
  BE604A504C904           :REM*205
113 DATA 90D8AC8710889848 20C9*0
  A68F0034C9B08A979A0*0F20CB0
```

RUN it right: **C-64; joystick**

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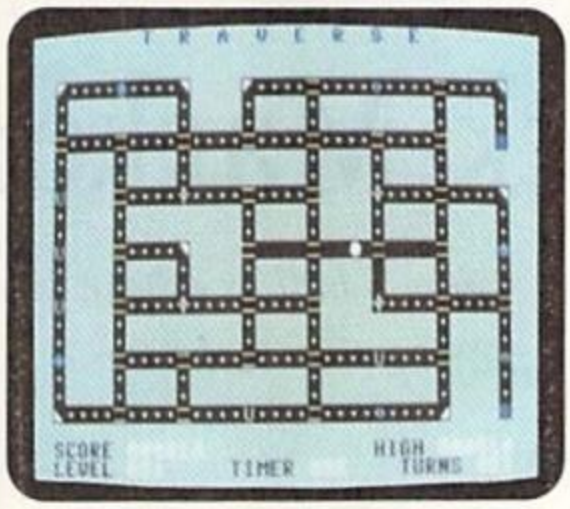

Traverse is a challenging combination of features from Pac Man and pinball.

```
    B2Ø11ØC4C71Ø8          :REM*224
114 DATA EE961ØAD961ØC95A9Ø34*A
    D861ØØAØA186D861Ø8D*961ØAD9
    31ØFØ24CE931Ø          :REM*152
115 DATA AC941Ø18AD8C1Ø79E5ØD*8
    D8C1Ø18AD8D1Ø79E9ØD*8D8D1ØA
    D8E1Ø79EDØD8D          :REM*4Ø
116 DATA 8E1Ø6Ø2Ø72ØAAA38E961*C
    9Ø49Ø25EØ65FØ2EEØ66*FØ44EØ6
    7FØ59AD891Ø4A          :REM*135
117 DATA BØ1ØEØ68FØ57EØ69FØ5D*E
    Ø6AFØ5AEØ6BFØ614C55*ØAØAØA1
    86D941ØA8B93D          :REM*4
118 DATA ØE4C58ØAAØ28A96Ø9139*A
    E861Ø2ØFBØAAD8A1ØDØ*Ø3CE8B1
    ØCE8A1Ø4C55ØA          :REM*24
119 DATA AD921ØØAØA186D941ØA8*B
    E2DØEBCF1ØDB139C92Ø*DØ384C4
    7ØAAD1BD429Ø3          :REM*254
12Ø DATA 4C58ØAA9ØØ8D15DØ6868*4
    C35Ø96Ø18AD941Ø69Ø2*29Ø34C5
    8ØA4CA6ØAAD94          :REM*15Ø
121 DATA 1ØAABCF1ØDB139C92ØDØ*Ø
    7E88A29Ø34C58ØA8E94*1ØA9Ø88
    D931Ø6Ø38AD8C          :REM*157
122 DATA 1ØE93A4A4A4AA838AD8D*1
    ØE9185Ø2AD8E1ØE9ØØ*4A66Ø24
    6Ø246Ø218B94D          :REM*177
123 DATA ØE65Ø28539B966ØE69ØØ*Ø
    9Ø4853AAØ28B1396ØAØ*7AAD1BD
    44A9ØØ2AØAAA2          :REM*77
124 DATA 78AD1BD44A9ØØ2A2FØ8C*8
    C1Ø8E8D1ØA9ØØ8D8E1Ø*8D931Ø6
    Ø8D871Ø2Ø51ØB          :REM*74
125 DATA 8EE3Ø78CE4Ø78DE5Ø76Ø*E
    E8F1ØDØ1CEE9Ø1ØAD9Ø*1Ø291FD
    Ø12CE911ØAD91          :REM*16
126 DATA 1Ø2Ø51ØB8ED6Ø78CD7Ø7*8
    DD8Ø76ØADA1Ø748AØØ5*38B9AØØ
    769ØØC93A9ØØ2          :REM*91
127 DATA A93Ø99AØØ7881ØEFCADØ*E
    968CDA1Ø7FØØCAC871Ø*C8CØ64B
    ØØ4982ØC9ØAAØ          :REM*179
128 DATA ØØB9AØØ7D9B8Ø79Ø13DØ*Ø
    6C8CØØ69ØF16ØAØØ5B9*AØØ799B
    8Ø7881ØF76ØAØ          :REM*83
129 DATA Ø5A93Ø99AØØ7881ØFA6Ø*A
    23ØAØ3ØC9649ØØ6E964*E84C55Ø
    BC9ØA9ØØ6E9ØA          :REM*21
13Ø DATA C84C5FØBØ93Ø6ØAD971Ø*F
    ØØ4CE971Ø6Ø38A926ED*861Ø8D9
    71ØAD9810F0Ø4          :REM*14
131 DATA CE9810600AD991ØØA186D*9
    91ØA8B9331ØDØØ48D99*1Ø6Ø8D9
    81ØA24Ø8E04D4          :REM*176
132 DATA B9341Ø8DØ1D4B9351Ø8D*Ø
    ØD4E88EØ4D4EE991Ø6Ø*AØØØB96
    D1Ø99ØØD4C8CØ          :REM*96
133 DATA 199ØF5601865A2C5A2DØ*F
    C6Ø85Ø284Ø3ADØØDC29*1ØFØF9A
    2Ø2AØØ9182ØFØ          :REM*15Ø
134 DATA FFA5Ø2A4Ø32Ø1EABAØØF*A
    5A2292ØDØØ2AØØ28C23*DØADØØD
    C291ØDØECA2Ø2          :REM*184
135 DATA 4CFFE9AD8C1Ø8DØ1DØAD*8
    D1Ø8DØØDØAD8E1Ø8D1Ø*DØ6ØA9Ø
    Ø8D15DØA9Ø285          :REM*29
136 DATA Ø4A6Ø42ØFFE938A918E5*Ø
    4AA2ØFFE9A9Ø62ØC3ØB*E6Ø4A5Ø
    4C9ØD9ØE56ØA9          :REM*11
137 DATA A2AØØE2Ø1EABA9Ø685Ø4*A
    9CFAØØE2Ø1EABA9CFAØ*ØE2Ø1EA
    BA9A7AØØE2Ø1E          :REM*7
138 DATA ABC6Ø4DØE7A9Ø385Ø4A9*Ø
    285Ø5A6Ø4A4Ø5182ØFØ*FFAD1BD
    429Ø3AAA9F7AØ          :REM*144
139 DATA ØEEØØØFØ12A9FAAØØECA*F
    ØØBA9ØØAØØFCAFØØ4A9*Ø5AØØF2
    Ø1EAB18A5Ø569          :REM*24
14Ø DATA ØA85Ø5C9259ØCA18A5Ø4*6
    9Ø385Ø4C9159ØBBA9ØD*8D74D98
    D83D98D64DA8D          :REM*59
141 DATA 73DAA9678D74Ø58D83Ø5*8
    D64Ø68D73Ø6A9528539*853BA9Ø
    4853AA9D8853C          :REM*45
142 DATA AØ28B139C965DØØBEE8A*1
    ØDØØ3EE8B1Ø4C19ØDC9*6ØDØ35A
    9ØØ85Ø2A2Ø3BC          :REM*79
143 DATA F1ØDB139C92ØFØØ3A9Ø1*2
    CA9ØØ4A26Ø2CA1ØECA6*Ø2BDF5Ø
    D1ØØBAD1BD429          :REM*91
144 DATA Ø3Ø91ØAABDF5ØDAØ2891*3
    9BDØ9ØE913B18A53969*Ø185398
    53BA53A69ØØ85          :REM*1Ø5
145 DATA 3A29Ø3Ø9D8853CA53AC9*Ø
    79Ø99A539C9469Ø936Ø*ADØEDC2
    9FE8DØEDCA5Ø1          :REM*8Ø
146 DATA 29FB85Ø1AØØØB9ØØDØ99*Ø
    Ø38B9ØØD199ØØ39C8DØ*F1A5Ø1Ø
    9Ø485Ø1ADØEDC          :REM*252
147 DATA Ø9Ø18DØEDCAD18DØ29FØ*Ø
    9ØE8D18DØAD11DØØ94Ø*8D11DØA
    Ø27B993ØF99Ø8          :REM*169
148 DATA 39881ØF76ØAD951ØDØ57*A
    DØØDC29ØFA8B91DØE1Ø*Ø3AD921
    Ø8D921ØØAØAØA          :REM*144
149 DATA AAAØØØBDBBØF993Ø39E8*C
    8CØØ89ØF4EE881ØDØØ3*EE891ØA
    D881Ø29Ø8AAAØ          :REM*114
15Ø DATA ØØBDDBØF993839E8C8CØ*Ø
    89ØF4AØØØAD891Ø29Ø1*AAFØØ2A
    22ØBDEBØF994Ø          :REM*86
151 DATA 39E8C8CØ2Ø9ØF44C31EA*F
    FØØØ1ØØØØØ1ØØFFØØØØ*ØØFFØØ2
    95Ø2769686861          :REM*196
152 DATA 68FF62666864FF666366*6
    66669696A6BØØØ4Ø4Ø1*Ø4ØØØ1Ø
    7Ø4Ø1ØØØ7Ø1Ø7          :REM*94
153 DATA Ø7Ø7ØAØA3ØEFFFFFFFF*F
    F01ØØØ3FFØØØ1Ø3FFØ2*Ø2FFØ1Ø
    ØØ3Ø2Ø3Ø2Ø1ØØ          :REM*22Ø
154 DATA ØØØ3Ø2Ø1Ø2Ø1ØØØ3Ø2Ø3*Ø
    1ØØØ1Ø3ØØØ2Ø3Ø2ØØØ1*Ø2ØØØ3Ø
    1ØØ285Ø78AØC8          :REM*218
155 DATA FØ184Ø689ØB8EØØ83Ø58*8
    ØA8DØF82Ø487Ø98CØØØ*ØØØØØØØ
    ØØØØØØ1Ø1Ø1Ø1          :REM*62
156 DATA Ø1Ø1Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø3*Ø
    3Ø3Ø3Ø3Ø8931D1D1D1D*1D1D1D1
    D1D1F541D1D52          :REM*58
157 DATA 1D1D411D1D561D1D451D*1
    D521D1D531D1D45ØØ13*111111Ø
    51D1DAØA5A5A5          :REM*48
158 DATA A5AØA5A5A5A5AØA5A5A5*A
    5AØA5A5A5A5AØA5A5A5*A5AØA5A
    5A5A5AØA5A5A5          :REM*23
159 DATA A5AØØDØØ1D1DA51D1D1D*1
    DA51D1D1D1DA51D1D1D*1DA51D1
    D1D1DA51D1D1D          :REM*63
16Ø DATA 1DA51D1D1D1DA51D1D1D*1
    DA5ØDØØ1111111D2Ø2Ø*2Ø2ØØØ1
    D1D1D1D1D112Ø          :REM*156
161 DATA 119D2ØØ9753434F5245*2
    ØØ53Ø3Ø3Ø3Ø3Ø3Ø2Ø2Ø*2Ø2Ø2Ø2
    Ø2Ø2Ø2Ø2Ø2Ø2Ø          :REM*159
162 DATA 2Ø974849474820Ø53Ø3Ø*3
    Ø3Ø3Ø3ØØD1D1D974C45*56454C2
    ØØ53Ø3Ø3Ø2Ø2Ø          :REM*16
163 DATA 2Ø2Ø2Ø9754494D45522Ø*Ø
    53Ø3Ø3Ø2Ø2Ø2Ø9754*55524E5
    32ØØ53Ø3Ø3ØØØ          :REM*1Ø4
164 DATA 1D1D12Ø55Ø5245535 32Ø*4
    649524520544F2Ø5Ø4C*4159ØDØ
    Ø12Ø547414D45          :REM*116
165 DATA 2Ø4F5645522E2E2E5Ø52*4
    553532Ø46495245ØDØØ*ØØØ4Ø6
    Ø7Ø787CØØØØ7C          :REM*228
166 DATA 787Ø6Ø4ØØØØØØ3E1EØE*Ø
    6Ø2ØØØØØØØØ2Ø6ØE1E*3EØØØØØ
    ØØØ1818ØØØØØ          :REM*81
167 DATA Ø1Ø3Ø6ØC183Ø6ØCØ8ØCØ*6
    Ø3Ø18ØCØ6Ø3C3C3C3C3*C3C3C3C
    3ØØFFØØØØØØØ          :REM*229
168 DATA FFØØC3663C243C66C3ØØ*1
    8183CE73C1818ØØØØ7E*7E7E7E7
    E7EØØØ666666          :REM*95
169 DATA 66663CØØØØØ3C66663C*Ø
    ØØØØ183C7E7E3C18ØØ*ØØØØØ7
    EØØØØØØØØØØ          :REM*36
17Ø DATA ØØ7EØØØØØØØØØØØØ7E*Ø
    ØØØØØØØØØØØ7EØØØØ*ØØØØØ3
    C7E7E7E7E3CØØ          :REM*194
171 DATA 14Ø25A14Ø25A14Ø25A17*Ø
    25A14Ø2CC17Ø3221 7Ø2*CC14Ø38
    617Ø386 17Ø322         :REM*238
172 DATA 17Ø2CC14Ø3861 7Ø38617*Ø
    3221 7Ø2CC14Ø3861 7Ø3*8617Ø32
    228Ø2CCØØØØØ          :REM*2Ø7
173 DATA Ø8Ø7ØØ1AØAØØØØØØØØØ*Ø
    ØØØFFFFØØØØ8ØØØØØØ*1E919FØ
    ØØØØØØØØØØØØ          :REM*2Ø
174 DATA ØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØ                  :REM*2Ø9
175 DATA -1                :REM*29 ■
```

RUN it right: **C-64; joystick**

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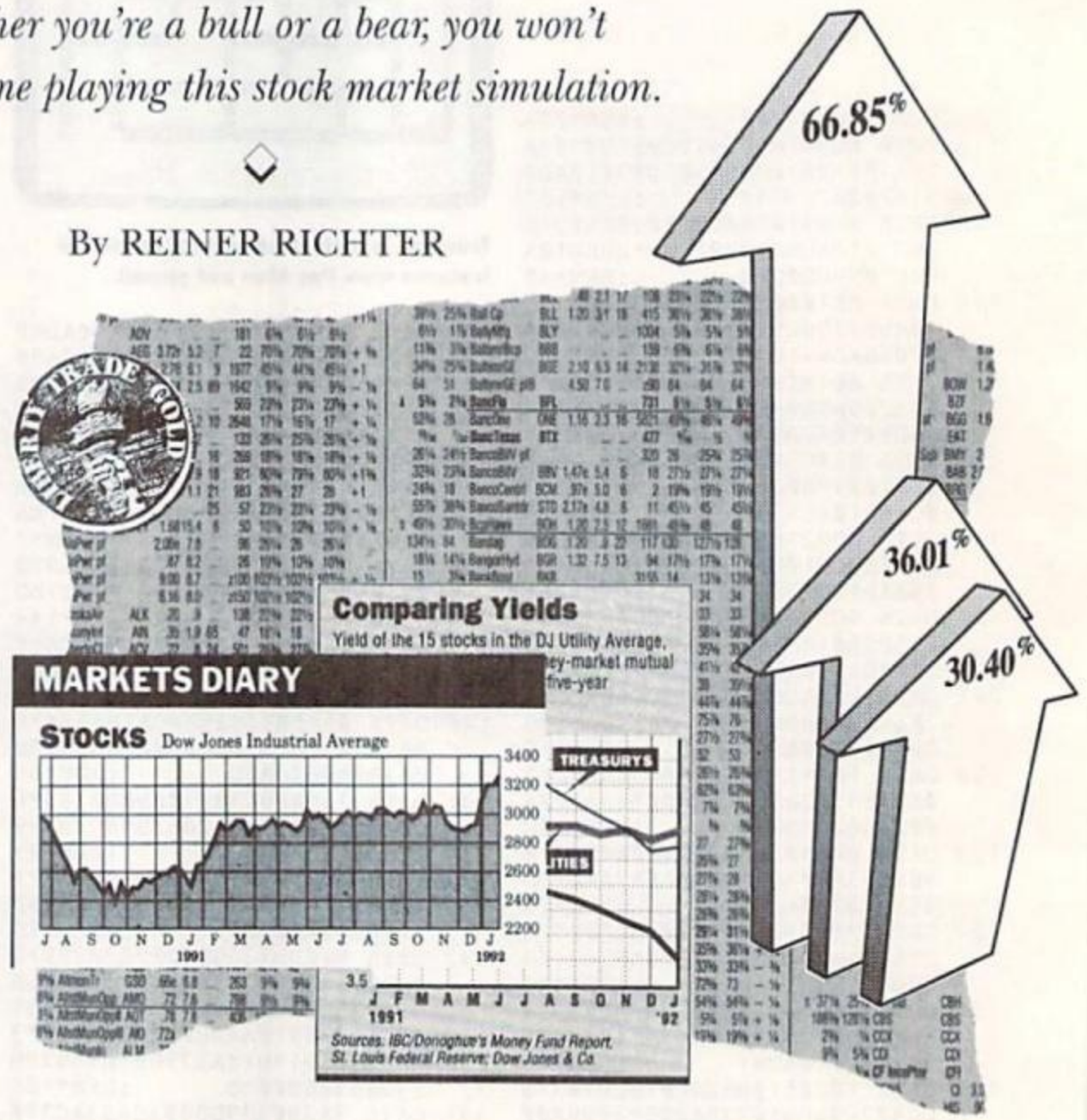
Stock Market 64

Whether you're a bull or a bear, you won't lose a dime playing this stock market simulation.

By REINER RICHTER



If you had money to invest in the stock market, how would you set up your portfolio? Would you take risks? Be aggressive? Try your hand at stock market investing with this simple stock market simulation.

You start with $50. (All values are displayed in cents, though, so you actually have 5000 cents.) The object of the game is to invest your money wisely. After 100 days of trading the game ends. If you end the game with less than $1000, keep your day job. A final value between $1000 and $2500 is good. Between $2500 and $10,000 is excellent. If you end up with more than that, I want your secret! Your score is then written to the high scores table.

Type in Stockmarket 64 from Listing 1 using the Checksum on page 33 and save it to disk. The first time you run the game, it will create a high score table, so be sure that there are at least two blocks free on your disk.

When you play, information about each stock is displayed across the top of the playing screen. BUY is the price at which other investors are offering to sell their shares (that is, the price at which you can buy shares). +/– is the change in the buy price since the previous day. OWN is the number of shares you own. VALUE is the current selling price of your shares. AVER is the mean (average) price at which you bought the shares. The share values change daily.

Current data is displayed below the share data. DAY is the current day. TOTAL VALUE is the combined value of your cash and investments. CASH is how much money you have available to invest.

What does it feel like to bet the farm on an up-and-coming stock? You have two ways to find out: Call up E.F. Hutton . . . or play Stockmarket 64. R

Reiner Richter lives in Australia. He programs in Basic and assembly language.

Listing 1. Stock Market 64. Also available on the May/June ReRUN disk. To order, call 1-800-824-5499.

```
Ø REM STOCKMARKET 64 - REINER R
  ICHTER                    :REM*118
1Ø FORJ=ØTO5:READSZ(J),CL$(J):N
  EXT                       :REM*15Ø
2Ø FORJ=ØTO9:SH(J,Ø)=INT(RND(Ø)
  *2ØØ+5Ø):SH(J,2)=INT(RND(Ø)*
  11-5):NEXT                :REM*2Ø7
3Ø DL=5ØØØ:DY=1             :REM*252
4Ø POKE5328Ø,Ø:POKE53281,Ø:POKE
  2Ø4,1                     :REM*217
5Ø PRINT"{SHFT CLR}{CTRL 2}{4 S
  PACEs}{CTRL 9}STOCKMARKET 64
  {CTRL Ø} {COMD 5}BY REINER R
  ICHTER                    :REM*247
6Ø PRINT"{CTRL 8}#{2 SPACEs}BUY
   SELL +/-{4 SPACEs}OWN{3 SPA
  CEs}VALUE{2 SPACEs}AVER":TT=
  DL                        :REM*76
7Ø FORJ=ØTO9:SH(J,1)=INT(SH(J,Ø
  )*.9):SH(J,4)=SH(J,3)*SH(J,1
  ):TT=TT+SH(J,4)           :REM*6
8Ø SH(J,5)=Ø:IFSH(J,3)>ØTHENSH(
  J,5)=INT(SH(J,6)/SH(J,3))
                            :REM*192
9Ø PRINT"{CTRL 2}"CHR$(48+J);:F
  ORK=ØTO5                  :REM*29
1ØØ PRINT" "CL$(K)RIGHT$("{7 SP
```

RUN it right: **C-64**

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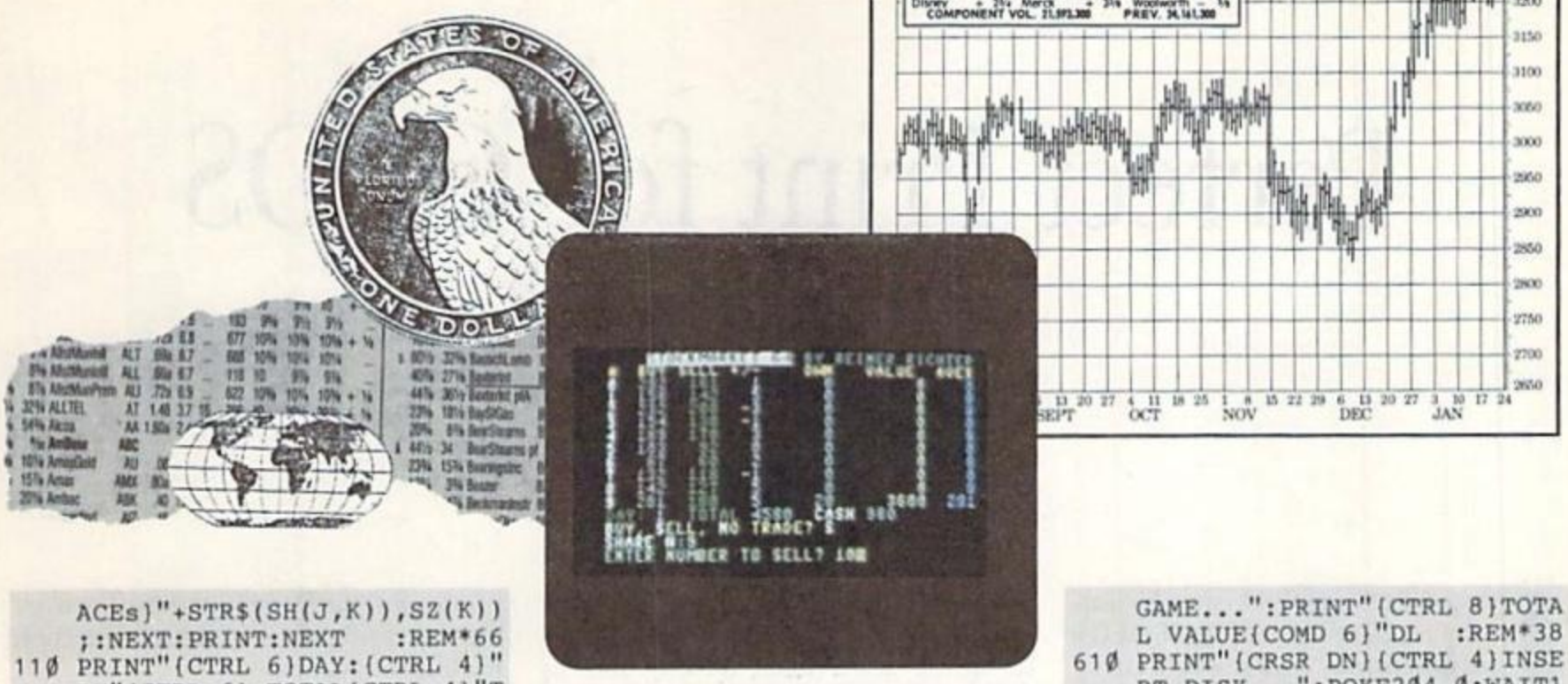

Buy! Sell! Diversify! Play the stock market with your C-64.

```
    ACEs)"+STR$(SH(J,K)),SZ(K))
    ;:NEXT:PRINT:NEXT    :REM*66
11Ø PRINT"{CTRL 6}DAY:{CTRL 4}"
    DY"{CTRL 6} TOTAL{CTRL 4}"T
    T"{CTRL 2} CASH{CTRL 4}"DL
                         :REM*181
12Ø IFDY=1ØØTHEN59Ø      :REM*54
13Ø PRINT"{CTRL 2}B{CTRL 8}UY,
    {CTRL 2}S{CTRL 8}ELL, {CTRL
     2}N{CTRL 8}O TRADE? {CTRL
    2}";                 :REM*2Ø2
14Ø POKE2Ø4,Ø:GETA$:IFA$=""THEN
    14Ø                  :REM*233
15Ø POKE2Ø4,1:PRINTA$"{CRSR LF}
    ";                   :REM*212
16Ø IFA$="B"THEN38Ø      :REM*91
17Ø IFA$="S"THEN49Ø      :REM*216
18Ø IFA$<>"N"THEN14Ø     :REM*169
19Ø REM *** NO TRADE ***:REM*72
2ØØ PRINT:PRINT"ANOTHER DAY..."
    :DY=DY+1             :REM*6
21Ø FORJ=ØTO9:SH(J,2)=SH(J,2)+I
    NT(RND(Ø)*11-5)      :REM*18Ø
22Ø IFSH(J,2)<4ØORRND(Ø)>.1THEN
    24Ø                  :REM*189
23Ø PRINT"{COMD 3}STOCK"J"CRASH
    ES":SH(J,2)=INT(RND(Ø)*1Ø-4
    Ø):GOTO25Ø           :REM*235
24Ø IFSH(J,Ø)>999ANDRND(Ø)<.1TH
    EN23Ø                :REM*51
25Ø IFSH(J,2)>-4ØORRND(Ø)>.1THE
    N27Ø                 :REM*229
26Ø PRINT"{CTRL 6}TAKEOVER BID
    FOR STOCK"J:SH(J,2)=INT(RND
    (Ø)*3Ø+1Ø)           :REM*2Ø8
27Ø IFABS(SH(J,2))<2ØORRND(Ø)>.
    1THEN29Ø             :REM*73
28Ø SH(J,2)=INT(RND(Ø)*9):PRINT
    "{COMD 8}RUMOURS CONCERNING
     STOCK"J             :REM*59
29Ø SH(J,Ø)=SH(J,Ø)+SH(J,2)
                         :REM*64
3ØØ IFSH(J,Ø)>ØTHEN33Ø   :REM*215
31Ø PRINT"{COMD 3}STOCK{CTRL 2}
    "J"{COMD 3}HAS COLLAPSED.IN
    VESTMENTS LOST"      :REM*7
32Ø FORK=1TO6:SH(J,K)=Ø:NEXT:SH
    (J,Ø)=INT(RND(Ø)*2ØØ+5Ø)
                         :REM*64
33Ø IFSH(J,3)<1ØØORRND(Ø)>.1THE
    N36Ø                 :REM*166
34Ø PRINT"{COMD 6}STOCK"J"YEILD
    S DIVIDEND OF{CTRL 2}"SH(J,
    3)                   :REM*129
35Ø DL=DL+SH(J,3)        :REM*28
36Ø NEXT                 :REM*235
37Ø PRINT"{CTRL 8}PRESS A KEY":
    POKE2Ø4,Ø:WAIT197,191:POKE1
    98,Ø:POKE2Ø4,1:GOTO4Ø
                         :REM*117
38Ø REM *** BUY ***      :REM*167
39Ø PRINT:PRINT"SHARE #:{CTRL 8
    }";:POKE2Ø4,Ø        :REM*18
4ØØ GETA$:IFA$=""THEN4ØØ:REM*35
41Ø IFA$<"Ø"ORA$>"9"THEN4Ø
                         :REM*218
42Ø J=VAL(A$):M=INT(DL/SH(J,Ø))
                         :REM*1Ø2
43Ø POKE2Ø4,1:PRINTA$:PRINT"ENT
    ER NUMBER TO BUY (MAX"M")"
                         :REM*163
44Ø INPUTK:K=INT(K):IFK<ØORK>MT
    HENPRINT"{COMD 3}ILLEGAL VA
    LUE":GOTO48Ø         :REM*255
45Ø SH(J,3)=SH(J,3)+K:M=SH(J,Ø)
    *K                   :REM*123
46Ø SH(J,6)=SH(J,6)+M:DL=DL-M
                         :REM*49
47Ø PRINT"{CTRL 6}SHARES BOUGHT
    "                    :REM*1Ø1
48Ø FORJ=1TO5ØØ:NEXT:GOTO4Ø
                         :REM*127
49Ø REM *** SELL ***     :REM*128
5ØØ PRINT:PRINT"SHARE #:{COMD 6
    }";:POKE2Ø4,Ø        :REM*63
51Ø GETA$:IFA$=""THEN51Ø
                         :REM*17Ø
52Ø IFA$<"Ø"ORA$>"9"THEN4Ø
                         :REM*83
53Ø J=VAL(A$):POKE2Ø4,1:PRINTA$
                         :REM*7
54Ø INPUT"ENTER NUMBER TO SELL"
    ;K:K=INT(K)          :REM*251
55Ø IFK<1ORK>SH(J,3)THENPRINT"{
    COMD 3}ILLEGAL VALUE":GOTO4
    8Ø                   :REM*122
56Ø M=SH(J,3)-K:SH(J,6)=SH(J,6)
    *(M/SH(J,3))         :REM*2Ø1
57Ø SH(J,3)=M:DL=DL+SH(J,1)*K
                         :REM*1Ø3
58Ø PRINT"{CTRL 6}SHARES SOLD":
    GOTO48Ø              :REM*95
59Ø REM *** 1ØØ DAYS ***
                         :REM*143
6ØØ DL=TT:PRINT"{CTRL 2}END OF
    GAME...":PRINT"{CTRL 8}TOTA
    L VALUE{COMD 6}"DL   :REM*38
61Ø PRINT"{CRSR DN}{CTRL 4}INSE
    RT DISK...":POKE2Ø4,Ø:WAIT1
    97,191:POKE198,Ø:POKE2Ø4,1
                         :REM*3
62Ø FL$="Ø:HISTOCK,S":OPEN15,8,
    15:OPEN8,8,8,FL$+",R"
                         :REM*9Ø
63Ø INPUT#15,J,A$,K,M:IFJ>19AND
    J<>62THENCLOSE8:GOTO76Ø
                         :REM*1
64Ø IFJ<>62THEN66Ø       :REM*169
65Ø FORJ=1TO9:HI$(J)="-":HI(J)=
    Ø:NEXT:PS=1:GOTO67Ø  :REM*14
66Ø FORJ=1TO9:INPUT#8,HI$(J):IN
    PUT#8,HI(J):NEXT:PS=1Ø
                         :REM*79
67Ø FORJ=9TO1STEP-1:IFDL>HI(J)T
    HENPS=J              :REM*124
68Ø NEXT:PRINT"{CTRL 2}POSITION
    :"PS                 :REM*21Ø
69Ø FORJ=8TOPSSTEP-1:HI$(J+1)=H
    I$(J):HI(J+1)=HI(J):NEXT
                         :REM*34
7ØØ CLOSE8:IFPS<1ØTHENINPUT"{CT
    RL 8}ENTER NAME";HI$(PS):HI
    (PS)=DL              :REM*153
71Ø PRINT#15,"S"+FL$:INPUT#15,J
    ,A$,K,M:IFJ>19THEN76Ø
                         :REM*252
72Ø OPEN8,8,8,FL$+",W"   :REM*233
73Ø FORJ=1TO9:PRINT#8,HI$(J)CHR
    $(13)HI(J)           :REM*24Ø
74Ø PRINT"{CTRL 2}"CHR$(J+48)"{
    CTRL 8}"HI(J)"{CRSR UP}{COM
    D 6}":PRINTTAB(11)HI$(J):NE
    XT                   :REM*8Ø
75Ø CLOSE8:INPUT#15,J,A$,K,M
                         :REM*193
76Ø PRINT"{COMD 8}"J;A$;K;M:PRI
    NT"{COMD 3}PRESS A KEY TO P
    LAY AGAIN...":POKE2Ø4,Ø:CLO
    SE15                 :REM*78
77Ø WAIT197,191:POKE198,Ø:POKE2
    Ø4,1:RUN             :REM*114
78Ø DATA4,"{COMD 3}",4,"{CTRL 6
    }",3,"{COMD 8}",6,"{CTRL 4}
    ",8,"{COMD 6}",4,"{COMD 7}"
                         :REM*34
```

■

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Perfect Print for GEOS

At last! True letter-quality output for your geoWrite files.

By STEVE VANDER ARK

It's a GEOS user's dream: beautifully rendered printouts of GEOS proportional fonts, each curve smooth, each angle clean—*even in italics*. But let's face it, a thousand fonts and every interpolating printer driver in the world won't make it happen unless you decide to shell out close to a grand for a laser printer.

But wait! If you've turned the page and seen the sample printouts, you know now that smooth, elegant geoWrite output on a dot-matrix printer is a reality, with Perfect Print. This new product from Creative Micro Designs is divided into two sections: LQ for geoWrite and HQ for geoPaint and geoPublish.

The star of Perfect Print is GEOS LQ (for *letter quality*). The GEOS LQ application, with its related printer drivers, prints geoWrite documents in extremely high resolution. For geoPaint and geoPublish, the HQ (*high quality*) set of interpolating drivers gives you smooth, high quality printouts. Filling out the package are special parameter files, utilities and a collection of fonts for the LQ and HQ systems.

HQ Stands for High Quality

The HQ drivers operate on the same principle as the interpolation drivers available in the public domain, such as the Lasermatrix and Shell drivers. The printouts you can get from GEOS HQ will be quite a bit smoother than you'd get with the printer drivers that come with GEOS itself. But, although the print is rounded off somewhat, the typical "chunky" look isn't entirely eliminated.

The Perfect Print HQ fonts reduce the printout's jagged appearance only because they substitute simple angles for curves, resulting in fonts that look smooth but somewhat stilted.

This is the best that Perfect Print can deliver for geoPaint or geoPublish documents, so if you work primarily within these applications, Perfect Print is not for you. Better HQ drivers are on their way, but for now you can get the same or better quality from public domain sources for very little money. (I use the excellent Shell drivers by George Wells found on Q-Link in the GEOS Software library Printer and Input Drivers section. Search using your printer name and the screen name GeoRep.)

But hold on to your hats. Perfect Print has an ace up its sleeve: GEOS LQ.

LQ Delivers Excellent Print

When geoWrite is the game, GEOS LQ holds the winning hand. There is simply no substitute for the quality this system will produce. Nothing like this has been possible for the Commodore before. The print quality rivals that of high profile software such as Professional Page for the Amiga.

To install GEOS LQ, you determine which installation file is needed for your printer/interface combination. Then select two configuration files, a connection file and an adaptation file.

A third type of configure file, the parameter file, can further customize your printing. For example, one parameter file adjusts page length, one makes labels, another slightly reduces the image to improve the quality and then lengthens the geoWrite page to compensate, and there are others. These files are presented as geoWrite documents that can be examined and modified as you choose.

You have complete control over your printer's operation. But if you're not the kind of user who likes to tinker under the hood, don't worry. The manual makes it relatively easy to select the proper files to get you started.

Using GEOS LQ

Once you've set up for GEOS LQ with configure files, a font or two, and the LQ ►

How GEOS LQ Works

To print documents, GEOS normally translates the individual dots on the screen (pixels) to dots on the printed page, dot for dot. On the screen the image blurs together and everything looks smooth, however, on paper the dots produce a definite jagged edge wherever there is an angle or a curve.

The pixel size determines how many pixels are on the screen; large pixels mean lower resolution, fewer dots being sent to the printer, and a more jagged printout. Unfortunately, Commodore pixels are fairly large.

To increase the number of dots used to make up the printed character, *multistrike* drivers add dots between the ones GEOS itself asks for, thereby filling in some of the jagged edges. *Interpolation* drivers go that method one better, using algorithms to determine where to insert the dots for best results.

GEOS LQ uses a different method altogether. Added dots mean added resolution, but the system doesn't just guess where they'd look best on the page. Instead, it starts with the bit-mapped image of a larger version of the font and condenses it to the size you want. To print in 12-point Roma, for example, LQ takes the dot pattern of 36-point Roma and scrunches it down to 12 point. If a font size doesn't exist in a multiple of the requested point size, such as 12- and 36-point, GEOS LQ scales the nearest equivalent to fill in. Therefore, some sizes print more accurately than others. □

—SVA

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application on your geoWrite disk, you're ready to work a few printing miracles. The geoWrite documents you create should use the LQ fonts included with the system, though GEOS LQ will do a pretty slick job of smoothing out regular GEOS fonts too. If your document uses the regular Roma or University fonts, GEOS LQ will automatically substitute the LQ fonts if they're available.

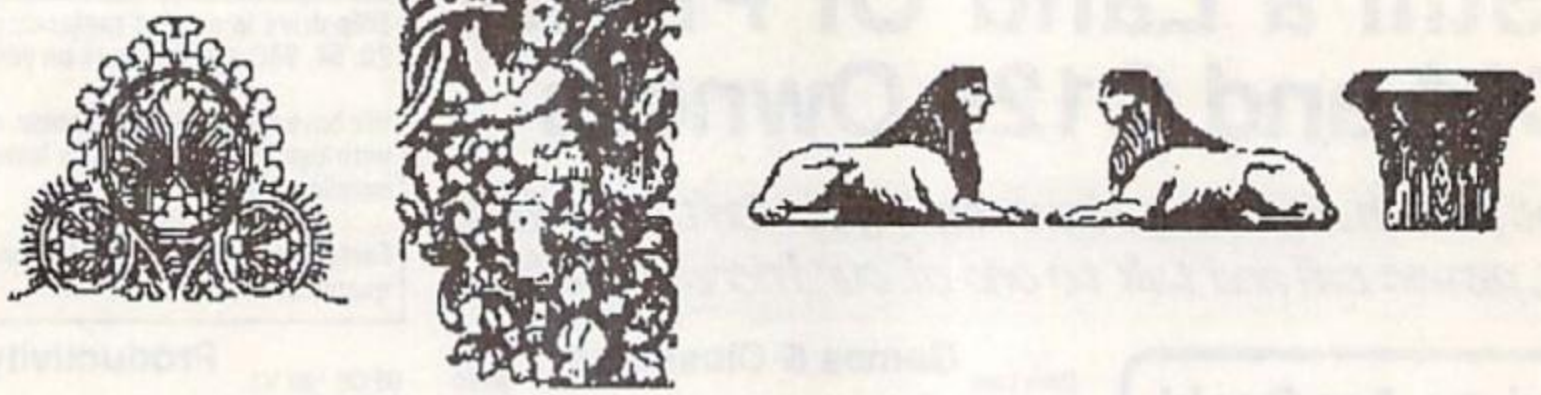
GeoWrite runs as usual; all style and formatting options are supported. When you're ready to print, there are several ways to activate GEOS LQ, including a utility to run it as a desk accessory.

The control panel that appears on the screen lets you fine tune the process, setting parameters for page range, number of copies, density, and so on. If you don't want to reset these parameters each time, you can save your settings to disk.

Then the printer goes to work and a beautifully detailed document appears. When the printer has finished (which sometimes takes a while), the end menu lets you return to geoWrite, go to the print control panel, or return to the deskTop.

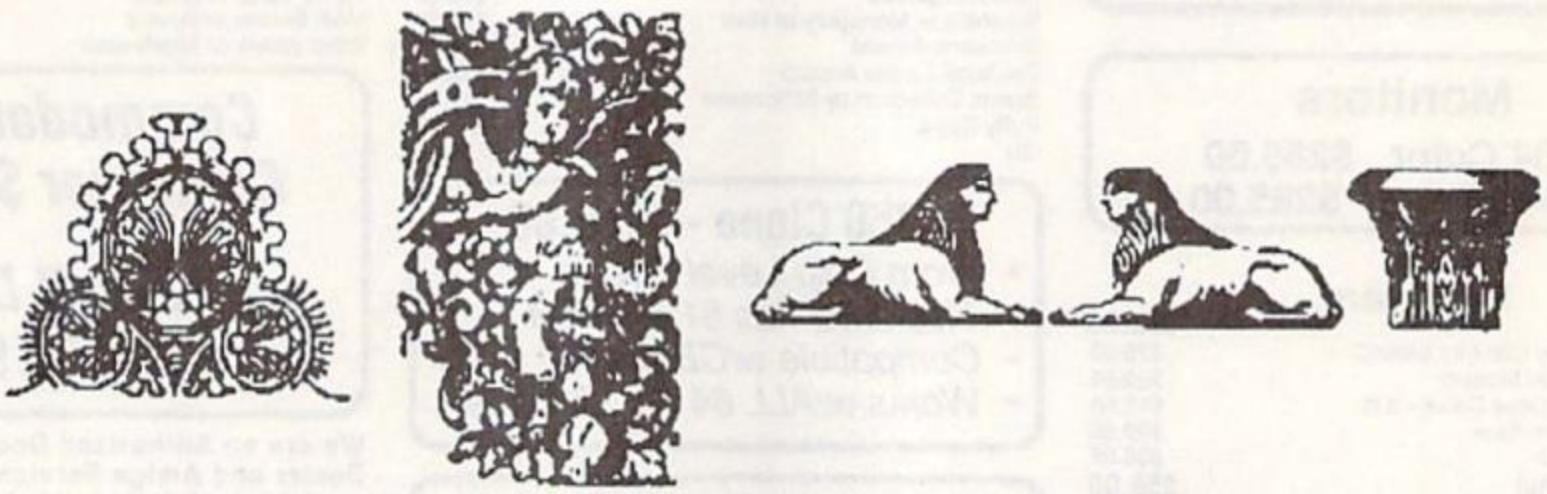
The LQ fonts include many point sizes to give GEOS LQ all the information it needs. Of course, this makes the font files very large, and you might find yourself quickly using up disk space. To ease the disk space crunch, the package in-

Continued on p. 30.



The graphics shown above are an example of bit-mapped output from geoWrite using the "Epson24pin" GEOS printer driver by George Wells on an Epson LQ-500 24 pin printer. This text was produced using the same printer and driver combination. This text was formatted in Roma 12. geoWrite also handles font styles such as *italics* and **bold**. Here are examples of some of the other fonts (in 15 point size):

California LQ Ornament LQ Quill LQ Gondor LQ



The graphics shown above are an example of bit-mapped output from Perfect Print LQ using a Panasonic KX-P1123 24 pin printer at 360 x 360 dots per inch. This text was produced using the same printer with Perfect Print's GEOS LQ print system which prints geoWrite documents. This text was formatted in Roma LQ 10 point, one of the included fonts. The system also handles font styles such as *italics* and **bold**. Here are examples of some of the other fonts (in 15 point size):

California LQ Ornament LQ Quill LQ Gondor LQ

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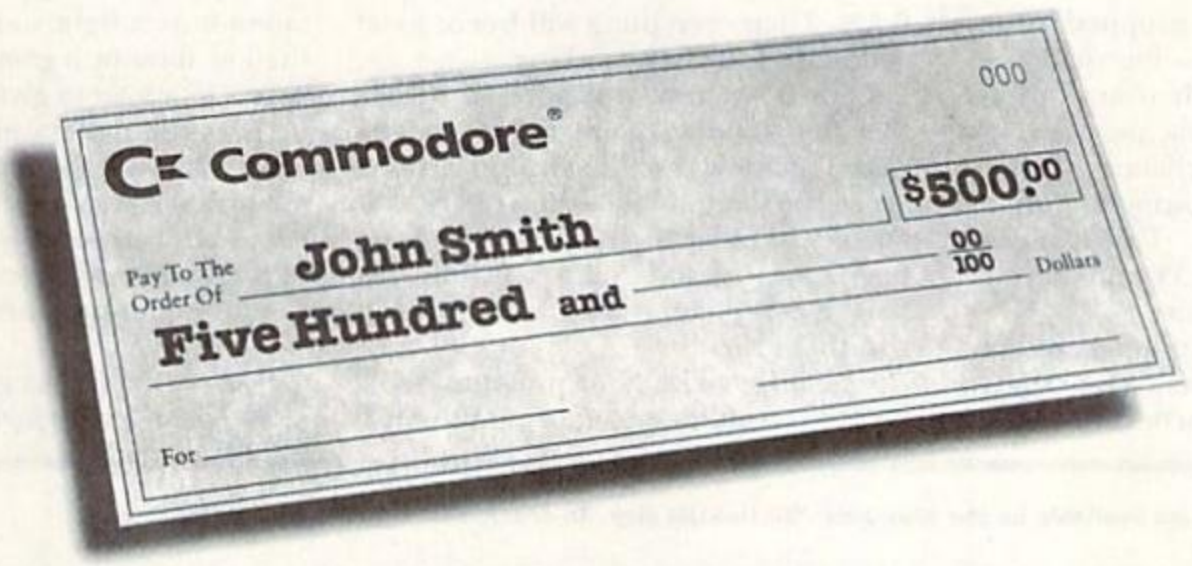

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128 Mode

You've used your C-128 for a lot of different things over the years, but I'll bet you've never used it as a sundial.

By MARK JORDAN

ONE EVENING RECENTLY I was sitting in my living room with the TV on and the lights off. I was vacantly watching a shadow on the ceiling when it struck me that the light from the TV had enough power to create moving shadows that changed as images moved on the screen. It dawned on me that the TV was a light source, actually a bunch of lights, called pixels (for *picture elements*).

Hmmm. How could this be demonstrated with my computer? I did some quick-and-dirty programming to move a white sprite across a dark screen, and sure enough, a pencil propped against the screen created a moving shadow.

I then remembered how my kids had spotted a sundial recently, and asked how it worked. Here was a chance to kill two birds with one stone. Listing 1, "Sundial 128," is the "lab report." Type it in using the Checksum on page 33, and don't forget to save before running it.

Scrounge around your house and find a piece of cardboard about a foot square, a nail at least three inches long and a pencil. Jab the nail through the cardboard near the center. This nail is the *gnomon* (the part that casts the shadow) on your sundial. The cardboard is the dial's face. Place the cardboard just under the front of your monitor with the nail centered with the screen. Run the program, and darken the room.

You have three options: Set, Guess and Else. Press S to set your timepiece, and you'll see the morning sun (a white ball) rise in the east (the left side of your screen). The time of day will be displayed along with it: 5:30, 5:35, and so on up to 6 A.M. Then everything will freeze to let you make your first marking.

Look down at your sundial. You'll see that the standing pointer does indeed cast a shadow, not sharp, but visible. Trace the shadow-line with a pencil. Hit any key to move the sun along by hour, tracing the shadow as it moves until you have a complete, calibrated sundial (6 A.M. to 7 P.M.).

Whenever you run the program, you'll need to recalibrate by moving the cardboard until you get the lines to match up with the times.

When you select Guess, the sun will again make its ascent, only it will stop along the way and you will be asked to guess the time using the cursor keys, which step through hours and minutes in five-minute increments. Make your selection and press RETURN to see the results.

The third option is just for the heck of it, and lets you watch the sun rise and fall with the time displayed along with it.

Doing this little experiment prompted me to think of other projects that use the monitor as a light source: an animated shadow show or a game that sends light beams to a map to give clues.

Have you done a nifty home experiment with your Commodore 128? Send me a description of it, including your name, address and telephone number. If I get enough responses I'll devote an upcoming column to them. R

When he's not in his guise of Dr. Science, Mark Jordan teaches high school English.

Listing 1. Sundial 128. Also available on the May/June '92 ReRUN disk. To order, call 1-800-824-5499.

```
10 GOSUB380:REM DRAW CIRCLE/SPR
   ITES                        :REM*6
20 R=(PI)/180:C=160*160:AN=11:H
   =5:HH=0                     :REM*92
30 PRINT"{SHFT CLR}S TO SET, G
   TO GUESS, ELSE OTHER KEY"
                               :REM*190
40 GETKEYSE$:PRINT"{SHFT CLR}{C
   OMD 4}"                     :REM*134
50 DO                          :REM*28
60 IF SE$="G" AND RND(1)>.97 TH
   EN BEGIN                    :REM*225
70 CHAR,0,0,"USE CRSR KEYS TO G
   UESS, RETURN TO CHECK"
                               :REM*115
80 H1=H:H2=HH:H=0:HH=0         :REM*211
90 CHAR,0,1,"{34 SPACEs}":REM*2
100 CHAR,0,1,"":GOSUB360
                               :REM*153
110 DO:GETKEYA$:IFA$="{CRSR DN}
    "THENHH=HH+1:IFHH>15THENHH=
    0                          :REM*235
120 IFA$="{CRSR RT}"THENH=H+1:I
    FH>11THENH=0               :REM*27
130 CHAR,0,1,"":GOSUB360
                               :REM*191
140 LOOPUNTIL A$=CHR$(13)
                               :REM*254
150 IFH=H1 AND HH=H2 THEN PRINT
    "{CTRL G}"                 :REM*73
160 H=H1:HH=H2                 :REM*172
170 CHAR,12,1,"CORRECT ":GOSUB3
    60                         :REM*255
180 BEND                       :REM*229
190 AN=AN+1:IFAN>180THENEXIT
                               :REM*185
200 IFSE$<>"G"THENGOSUB350
                               :REM*188
210 H=H+1:IFH=12THENHH=HH+1:H=0
                               :REM*26
220 S=SIN(AN*R)                :REM*47
230 Y=160*S:X=SQR(C-Y*Y)
                               :REM*206
240 IFAN<90THENX=-X            :REM*230
250 X=X+160:Y=251-Y            :REM*175
260 POKE4861,1                 :REM*209
270 MOVSPR1,X,Y-20             :REM*149
280 MOVSPR2,X+24,Y-20          :REM*92
290 MOVSPR3,X,Y                :REM*172
300 MOVSPR4,X+24,Y             :REM*43
310 POKE4861,0                 :REM*5
320 IFH=1THENIFSE$="S"THENCHAR,
    0,2,"PRESS KEY":GETKEYA$:CH
    AR,0,2,"{9 SPACEs}":REM*236
330 LOOP                       :REM*52
340 GOTO20                     :REM*211
350 CHAR,0,0,""                :REM*203
360 PRINT"TIME: "+HO$(HH)+":"+R
    IGHT$("00"+MID$(STR$(H*5),2
    )+" ",3)                   :REM*14
370 RETURN                     :REM*2
380 FAST:PRINT"{SHFT CLR}{CTRL
    8}","SUNDIAL"              :REM*7
390 COLOR4,1:COLOR0,1          :REM*29
400 GRAPHIC1,1                 :REM*28
410 CIRCLE1,74,71,23,20        :REM*40
420 PAINT1,-1,+1               :REM*78
430 SSHAPEA$,50,50,73,70:SPRSAV
    A$,1                       :REM*213
440 SSHAPEA$,74,50,97,70:SPRSAV
    A$,2                       :REM*76
450 SSHAPEA$,50,71,73,91:SPRSAV
    A$,3                       :REM*80
460 SSHAPEA$,74,71,97,91:SPRSAV
    A$,4                       :REM*200
470 GRAPHIC0,1                 :REM*88
480 FORT=1TO4:MOVSPRT,0,0:NEXT
                               :REM*242
490 SPRITE1,1,2:SPRITE2,1,2:SPR
    ITE3,1,2:SPRITE4,1,2
                               :REM*165
500 DIMHO$(15):FORT=0TO15:READA
    $:HO$(T)=A$:NEXT           :REM*212
510 DATA 5,6,7,8,9,10,11,12,1,2
    ,3,4,5,6,7,8               :REM*239
520 SLOW:RETURN                :REM*62
```

■

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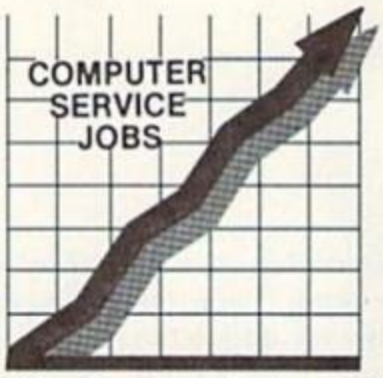

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COMMODORE CLINIC

Sure-fire cures for hard disk headaches, color printer conundrums, disk error ailments and keyboard cable cramp.

By TIM WALSH

Q *I occasionally read MS-DOS publications at work and notice a large number of high-capacity hard disk drives being sold for less than what I paid for my C-128 system. If I bought one of these drives and connected it to my C-128, would it work? I need to run a small business with my C-128.*

—FRANK GONZALES, JR.
SAN ANTONIO, TX

A The key word here is "connected." The hard drives sold through mail order companies cannot be connected to your Commodore because most are designed for computers that are SCSI-compatible (called "scuzzy," it stands for the *Small Computer System Interface* standard). SCSI drives require a separate hard disk controller card that plugs directly into the motherboard of the computer. While MS-DOS machines, and certain other computers, such as high-end Commodore Amiga models, are designed to accept SCSI attachments, the C-128, like the C-64, has no provisions for a hard disk controller card.

If you are interested, however, in using your C-128 as your business computer, you *will* need a hard disk drive. Creative Micro Designs of East Longmeadow, MA (413-525-0023) has the answer. They manufacture and support a wide range of high-capacity 40-, 60- and 120-megabyte hard disk drives for both Commodore 64s and 128s.

Q *I bought a Star Micronics NX-1000 Rainbow color printer and a Xetec Super Graphix printer interface. I've seen samples of beautiful color graphics this printer will make, but I can't find any software for my C-64 that lets my printer print in color. Do I have to get an IBM or Apple computer to print in color?*

—JASON LANGDON
SANTA FE, NM

A No, you don't need to get an Apple or IBM computer in order to access your printer's color options. I'd have to say that one of the most frequently asked questions that *RUN* receives is how to get color printers to print in color. And, fortunately, it's always nice to reply that it's not an overly complicated process.

When it comes to printing characters in color, the commands are found in the printer manual. If you're using a word processor that prints using the printer's character set, it's typically just a matter of preceding the text that you want printed in color with the command needed to select that color. You will also have to follow the text with a command to either turn off the color printing, or change to another color.

You'll not only have to check your printer manual for the codes needed to activate color printing and a selected color, but you'll also need to reference your word processor's documentation for information on using printer commands.

Printing color graphics is another matter altogether. Most C-64 and C-128 paint programs do not support color printing. The exception is GEOS and its accompanying paint program, geoPaint. Not only will you find a color printer driver for the NX-1000 Rainbow, but there are also conversion utilities available through the public domain for converting images, such as color RUN Paint files, to geoPaint format. Check with larger user's groups and online services such as QuantumLink and GEnie for such utilities.

Q *I have used an older Commodore 128 for many years, and I've had every type of disk error imaginable. I know lots of tricks to fix the errors, such as turning the disk drive off and on, inserting another disk, and a few more tricks. As a result, I can usually save the program in memory.*

Recently, I borrowed a friend's C-128D and I encountered a disk error. Because the 1571 drive is built into the computer, I couldn't figure out a solution. I couldn't turn the drive off and on, at least without turning off the computer. Any suggestions?

—BURT WALKER
MUNCIE, IN

A Floppy disk errors are a common occurrence on all brands of computer systems, and, as you well know, they're unmistakable on both the Commodore 64 and 128, because the disk drive's activity light always flashes when an error has occurred.

Disk errors often happen when you are saving a file to disk and something is amiss. In most instances the problem is simple: a file with the same name already exists on the disk, the disk is write-protected, the disk is full, or a track and sector error is encountered. The drive light starts flashing and disk access comes to a screeching halt.

If you encounter a C-128 disk error, just type the following in Direct mode:

```
PRINT DS$ (RETURN)
```

If the file already exists, the error message "63,FILE EXISTS,00,00" appears on the screen. Other disk errors are revealed in a similar fashion with the DS$ command. To use this command in Program mode, simply precede the command with a line number.

You and many other *RUN* readers might be surprised to know that the C-128D's built-in 1571 disk drive has a reset button, allowing the drive to be reset *without disturbing the program in memory*. If you look closely at the right side of the computer's chassis, you'll notice a deeply recessed button next to the reset button. Pressing this button with a pen or other small object resets the disk drive.

Q *Is there any way to extend the C-128D's keyboard cable? I have dreamed of the day when I can sit back and type with the keyboard in my lap instead of on the desk.*

—LORI DAVIS
SAN FRANCISCO, CA

A Yes, there is an easy way to extend your 128D's keyboard cable. Go to any computer dealer and pick up a 25-pin male-to-female serial cable (our local Radio Shack store carries a six-footer for $12.95). Plug one end of the cable into the computer and the other into the keyboard and you're in business. ■

Send your questions to Commodore Clinic, RUN Magazine, 80 Elm St., Peterborough, NH 03458. Questions are answered only through this column.

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MAGIC

These handy tricks let you save binary files in C-64 mode, sample the Commodore's musical talents and see page breaks in your program listings.

By TIM WALSH

$5EB PAGE BREAKS 64

If you're running low on printer paper, or simply want to get a better idea of your program listing's length, then type in Page Breaks 64. This terrific programmer's utility shows you exactly how many sheets of paper the printed listing will use before you print it out.

Page Breaks 64 works by modifying the C-64 List command. After typing in and saving the following program to disk, run it to activate the List command modification. When the program is active and you issue the List command, a line of hyphens appears across the screen every 66 lines (the length of a standard 8½ × 11-inch sheet). To prevent sending the lines to the printer, always press the RUN/STOP-RESTORE key combination before listing to the printer. To reactivate Page Breaks 64, enter SYS 49152.

```
Ø REM LIST PAGE BREAKS 64 - RICHARD PENN
                                        :REM*7Ø
1Ø A=65535:POKE 1,55:POKE 56334,Ø:POKE 95,
   Ø:POKE 96,16Ø:POKE 9Ø,255:POKE 91,255
                                        :REM*121
2Ø POKE 88,255:POKE 89,255:SYS 41919:POKE
   A,PEEK(A):POKE 56334,1               :REM*2Ø4
3Ø POKE 56324,149:POKE 56325,66         :REM*155
4Ø FOR U=49152 TO 49219:READ Q:POKE U,Q:CK
   =CK+Q:NEXT                           :REM*34
5Ø IF CK <> 784Ø THEN PRINT"ERROR IN DATA.
   .":END                               :REM*227
6Ø A=48589:B=42683:POKE A,76:POKE A+1,5:PO
   KE A+2,192                           :REM*246
7Ø POKE B,76:POKE B+1,53:POKE B+2,192:SYS4
   9152:PRINT"PAGE BREAKS INSTALLED"
                                        :REM*155
8Ø DATA 169,53,133,1,96,72,138,72,23Ø,2,16
   5,2,2Ø1,67,24Ø,1Ø,1Ø4,17Ø            :REM*243
9Ø DATA 1Ø4,133,98,134,99,76,2Ø9,189,169,1
   3,32,21Ø,255,169,45,162,4Ø,32        :REM*41
1ØØ DATA 21Ø,255,2Ø2,2Ø8,25Ø,169,13,32,21Ø
    ,255,169,Ø,133,2,76,16,192,8        :REM*78
11Ø DATA 72,169,Ø,133,2,1Ø4,4Ø,1Ø4,1Ø4,165
    ,2Ø,76,191,166                      :REM*211
```

—RICHARD PENN, MONTREAL, QUEBEC

$5EC BINARY FILE SAVER 64

While C-128 users have the BSAVE command for saving areas of memory to disk as binary files, C-64 users are out of luck. Binary File Saver 64 is a short utility that C-64 users can use to copy any specified area of memory to disk.

You can use this utility to make copies of pure machine language files that have been loaded into memory from Direct mode or from Basic loaders. Just run Binary File Saver 64 and answer the starting and ending address prompts. Next, make certain you have a formatted work disk in the drive, and the specified area of memory will be saved as a binary file to the disk. While the program is designed as a C-64 utility, it also works great in 128 mode!

```
Ø REM MEMORY DISK SAVER 64 - JOHN DAHLSTRO
  M                                     :REM*94
1Ø INPUT"STARTING ADDRESS";A           :REM*215
2Ø INPUT "ENDING ADDRESS";E            :REM*163
3Ø INPUT"ENTER FILENAME";F$:IF F$="" THEN
   3Ø                                   :REM*24Ø
4Ø OPEN8,8,8,F$+",P,W"                 :REM*1Ø7
5Ø C=INT(A/256):B=A-C*256:PRINT#8,CHR$(B);
   CHR$(C);                             :REM*144
6Ø PRINT#8,CHR$(PEEK(A));              :REM*254
7Ø A=A+1:IF A>E THEN CLOSE8:END        :REM*17Ø
8Ø GOTO 6Ø                             :REM*212
```

—JOHN DAHLSTROM, WOODHULL, IL

$5ED NOTE SAMPLER 128

If you're interested in experimenting with music on your C-128, then take a few minutes and type in Note Sampler 128. Not only will this program help you learn about the Commodore 128's note-playing capabilities, but it also lets you sample musical attributes, such as various octaves and durations.

Type in Note Sampler 128 using *RUN*'s Checksum and save it to disk. When you run the program, press the letter of one of the attributes, followed by the letter of a note. The program will display a message if an illegal key is pressed.

```
Ø REM NOTE SAMPLER 128 - GENE MILLER
                                        :REM*68
1Ø SCNCLR: PRINT"NOTE SAMPLER 128 :REM*1Ø4
2Ø PRINT:PRINT"ACTIVE KEYS ARE: C D E F G
   A B "                                :REM*176
3Ø PRINT:PRINT"MUSICAL FUNCTIONS:":REM*23Ø
4Ø PRINT:PRINT"T=ENVELOPE"              :REM*8Ø
5Ø PRINT"O=OCTAVE"                     :REM*158
6Ø PRINT"U=VOLUME"                      :REM*63
7Ø PRINT"V=VOICE"                      :REM*119
8Ø PRINT"W=WHOLE"                      :REM*221
9Ø PRINT"H=HALF"                       :REM*1Ø8
1ØØ PRINT"Q=QUARTER"                   :REM*195
11Ø PRINT"I=EIGHTH"                    :REM*133
12Ø PRINT"S=SIXTEENTH"                 :REM*145
13Ø PRINT:PRINT"ENTER A FUNCTION AND A NOT
    E"                                  :REM*183
14Ø TRAP 15Ø:GETKEYA$:PLAY"M"+A$:GOTO 14Ø
                                        :REM*239
15Ø IF ER=3ØØ THEN END:ELSE PRINT"{HOME}"
                                        :REM*192
16Ø PRINT"TRY ANOTHER KEY!":SLEEP 2:REM*73
17Ø GOTO 1Ø                             :REM*39
```

—GENE MILLER, SAN JOSE, CA ■

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From p. 22.
cludes a utility that lets you remove a few of the unused point sizes from a copy of the font. CMD has also included a utility that tells GEOS LQ to find the fonts it needs on the other drive. You can, for example, set up one disk with your geoWrite and GEOS LQ applications, and other disks with a few fonts, drivers and the documents that use them. It's a very efficient way to set things up.

Seven LQ fonts are included on the Perfect Print disk, including University and Roma. These will get you a long way, but as all GEOS users know, using lots of snazzy fonts makes geoWriting fun. The optional font package gives you 42 more fonts to play with. Most of them are very well designed and will be a welcome addition to your collection. I am particuarly fond of Roma, Gondor and Bold.

If that isn't enough, Jim Collette's excellent font editor (version 2.2) is included with Perfect Print, so you can design your own fonts. You also have the utilities you need to convert your fonts into the kind GEOS LQ will recognize.

As usual, CMD has demonstrated their commitment to the Commodore users by releasing a high-quality, professional package for use with GEOS. On a system where memory and speed are a constant problem, they include utilities and support applications to minimize these aggravations. The manual is exhaustive and detailed, fully explaining the system and the utilities. Much of the information it provides is not needed to run the system, but is a boon for those who like to get inside and mess around a little bit.

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Steve Vander Ark is a freelance writer who specializes in Commodore GEOS. He frequently contributes to RUN.

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JULY/AUGUST 1992

Coming Attractions

Super Users—Discover some of the most interesting and outrageous applications for the C-64. Meet some Super Users who are making their systems jump through hoops to eek out the last ounce of power and productivity from their machines.

Shareware—Some of the best software in this market is available for free, or for a minimal cost. Find out how to add to your software library without breaking the bank.

Computer Care—Maybe it won't last a lifetime, but the C-64/128 system will give you many years of use with the proper care and maintenance.

Arcade Action—No issue of *RUN* is complete without a line or two of great game code from programming ace Tony Brantner.

ReRUN—Don't forget that the programs available on the pages of *RUN* each issue are also available on disk on ReRUN. The current issue of ReRUN contains the programs in this issue plus a lineup of previously unpublished bonus programs.

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News and New Products

This issue, we commend the unsung heroes of Commodore computing, and their products. Here's to independent developers!

By JANICE CROTTY

The View from Here

PETERBOROUGH, NH—As large commercial developers back out of the Commodore market, the burden of support has fallen more and more to small independent developers. These people use their Commodores every day, and develop software because they love to do it.

Such initiative is what started the computer industry. Before Brøderbund and SSI were ever conceived, there was a guy in a basement somewhere inventing something cool. Often, the things he invented were full of bugs, awkward to use and not marketable. But occasionally the invention was brilliant; those were the products that propelled the fledgling computer industry.

Well, Commodore computing has come full circle. As the major players with their major bank books leave the Commodore market, ironically they hand it back to the people they took it from: the basement hackers with their passion for inventing.

In the past year, I've received several excellent independently made products. For example, CMD's RAMDrive was developed by Peter Fiset, a Rensselaer graduate student in his mid twenties. He's young, he's sharp, he loves the Commodore, and he's not alone. There are others, like Ron Hackley, who developed Fun Graphics Machine for his personal use, because he wasn't satisfied with the limitations of Print Shop and Print Master.

The bottom line is that creative individuals started this adventure, and they can carry us through.

The remainder of this column is devoted to small developers and their products.

Publish geoNovels

HOLLYWOOD, CA—A few issues back, *RUN* published a program for creating books on disk. (See "Dark and Stormy Night," May/June '91.) Unfortunately, the program didn't support GEOS. Ah, that good old hacker inspiration to the rescue: Now there's a freeware GEOS book construction program called **geoNovel Workshop**.

GeoNovel offers, among other things, high-resolution screens and graphics within the text. Of course, there is a price to this versatilit: To construct a geoNovel, you need GEOS 2.0, RAM expansion, knowledge of geoBasic and geoPublish, plus a general understanding of Commodore Basic. Right.

For more information, write to fLAt-DiSk SoftWorks, 1550 N. Hobart #317, Hollywood, CA 90027.

Check Register Update

ST. JOSEPH, MO—In January *RUN* reviewed **SEC Check Register**, a checkbook maintenance program for the Commodore 128. Though it received a very good review, the author, Allen Sparks, has alreasy produced an update, adding many new features and improving others.

These additions and improvements, initiated by feedback from users, make the program more flexible and effective. SEC Check Register v1.0418 offers reporting by date or reference number, a new withdrawal category and improvements in the Auto Check Off function, plus many other enhancements. It also comes with an improved half-sized, lay-flat manual.

SEC Check Register v1.0418 sells for $27.95, including priority mail postage. The company's new address is PO Box 0475, St. Joseph, MO 64504-0475.

Print Shop Graphics Collection

CINCINNATI, OH—C-64 desktop publishers take note: There's a new collection of Print Shop graphics available from Clip Art Cupboard. **Grafix Galore** gives you more than 80 original Printshop images. Grafix Galore includes everything from skateboards to Santa, from pirates to pizza. My favorite is a collection of lizards, frogs and fish. Sports and special occasions are also well represented. Grafix Galore includes graphics for both versions of Print Shop for the Commodore 64.

Grafix Galore sells for $11.95, including postage and handling. Write to Clip Art Cupboard, PO Box 317774, Cincinnati, OH 45231. ■

Software Copyrights

So you've developed an excellent program, but you don't know how to copyright it. (Hacker geniuses can't be expected to mess with such bureaucratic nonsense!)

Quite so, but the process is easy. To register your work with the U.S. Copyright Office, call and request Copyright Office Information Package #113, which includes the appropriate forms and instructions for registering software. Return the completed forms, and in 8–16 weeks you will receive your Registered Certificate of Copyright. Direct your correspondence to:

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And to any software pirates…Cut it out! All software is protected by copyright law, even if the company has gone out of business or the author has died.

According to Adam Konowe of the Software Publishers Association, "General works created on or after January 1, 1978, are protected under the Copyright Law for the life of the author plus 50 years after his or her death. If the work is a joint project, then it is protected for the life of the last surviving author plus 50 years after that person's death. Finally, in cases of work made for hire, the copyright endures for a period of 75 years from the year of its first publication or 100 years from the year of its creation, whichever expires first."

To find out more, contact the SPA Piracy Hotline at 202-452-1600.

—*JC*

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RUN's Checksum Program and Typing Hints

By BOB KODADEK and the *RUN* EDITORIAL STAFF

CHECKSUM IS A PROGRAM that proofreads your typing when you enter a listing from the magazine. It assigns a numerical value to each character that you type, adds up the values of the line you typed and displays the sum. (Checksum, therefore, means that it *checks* your typing by *summing* the characters.) It also verifies that you have typed the characters in the proper order. (Checksum won't tell you if you miss a line of code entirely, so verify that yourself.)

Checksum runs in the background when you type in lines of programming code. Whenever you type a line and press RETURN, the Checksum will display a value. Compare that value to the value published next to the line of code in the magazine (eg., :REM*123). If the numbers match, you've typed the line correctly. Simple.

Typing in Checksum and Other Good Advice

First, type in Checksum carefully from Listing 1 below. Be sure to press RETURN after every line to enter it into memory. Once you have typed the program, save it. In fact, save it a few times while you're typing, just to be safe. (This is good advice whenever you type in a program. I usually change the name each time I save; for example, Supergame1, Supergame2, and so on.)

Double check your work, making sure that you've typed in every line, and you've pressed RETURN after every line you've typed. If you make errors when typing in Checksum, a test run of Checksum will tell you which line is incorrect. (This safety feature works only in the Checksum program itself. It does not apply to any other listings in the magazine.) Whenever you find a typing error (in any program listing), fix it, press RETURN to enter the change, *save the program again*, and try another run. Repeat as often as necessary.

Important tip: Don't get discouraged if the program won't run. Be patient. Be thorough. It will work eventually.

You'll know your Checksum is ready when you see the line

```
TO TOGGLE ON OR OFF, SYS{number}
```

Using Checksum and Even More Good Advice

When you're ready to type in your first listing from the magazine, load and run Checksum. Make a note of the number that is displayed on the screen (49152 for the C-64; 3328 for the C-128). To activate and deactivate Checksum, type SYS followed by that number, then press RETURN. You need to have Checksum active whenever you're typing in a listing. Checksum must be deactivated, however, when you run the new program.

The next step is typing in a new program listing as it appears in the magazine. As you begin, you'll notice that at the end of each line is a colon, followed by the letters REM, an asterisk and a 1–3 digit number, like this:

```
:REM*123
```

Don't type any of this in: It's simply the Checksum value. Stop typing before the colon and press RETURN. If you've typed the line correctly, the number displayed on the screen will match the Checksum value. If the numbers don't match, you've made a mistake. Check the line carefully, make your changes and press RETURN. The computer won't know you've made a change unless you press RETURN to enter it.

A few type-in hints: The Checksum does not verify blank spaces in the program lines unless they are within quotation marks, because adding or omitting such spaces will not affect the operation of the program. The exception to this is hexadecimal Data statements. These are the Data statements, such as this one, that don't have commas:

```
100 DATA 12345678901234567890*12345678901234567890*123
    45678901234567890*
```

In statements such as these, you must have one space between the word DATA and the numbers that follow. Checksum will not catch that error.

One other common mistake is to type in the spaces that fall under the line number. In the example above you should not put a carriage return or spaces between the 3 and the 4 where the line breaks.

What the Heck Are Curly Braces?

As you type, you will undoubtedly be confused the first time you see curly braces {}. These braces mean "perform the function explained within." For example, {22 SPACES} means that you need to press the space bar 22 times. Don't type the braces. Other common examples are:

{SHIFT CLR}—hold down the SHIFT key and press the CLR-HOME key.
{2 CRSR DNs}—tap the cursor down key twice.
{CTRL 1}—hold the CONTOL key and press the 1 key.
{COMD T}—hold down the COMMODORE key and press the T key.
{5 LB.s}—press the British pound key (£ not #) 5 times.

Keep Your Chin Up—All You Need Is Patience

Continue typing in your program, saving often and checking each checksum value with the one in the magazine, until you've finished the listing. Phew! So now you're ready to run your program, right? Not quite. First, save it. Second, deactivate Checksum by typing SYS followed by 49152 for the C-64 or 3328 for the C-128.

Now you can run. Don't be discouraged if you still get an error. It happens. There are only two errors that Checksum won't catch (omitting a line and the Data statement spaces). Use Checksum faithfully. Be patient. Be thorough. It will work eventually. R

Listing 1. RUN's Checksum program.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
```

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SOFTWARE GALLERY

Let's go to the movies! Reviews of the latest cinema spinoffs. Plus a look at the latest spreadsheet program for the C-64.

By JOHN RYAN

ARACHNOPHOBIA ..... A

Oh, what a tangled web they weave . . .

No, I'm not referring to the spiders you'll meet in Arachnophobia, Disney's latest C-64 arcade game. I'm referring to the developers who made this game so addicting that it's tough to get up and walk away.

If you saw the movie *Arachnophobia*, you'll have a good idea of the game's basic storyline: A deadly species of South American spider has been accidentally imported into the United States. The most frightening thing about these spiders is they reproduce at an astounding rate. Now the entire state is overrun and the cities are screaming for help.

Enter Delbert McClintock (that's you), a fearless entomological warrior with a knack for snuffing out eight-legged nasties. You'll have to fight thousands of soldier spiders as you guide McClintock through each infested town in search of the queen. If you manage to kill the queen spider in every town, you'll get a choice assignment from the United Nations (lucky you): a trip into the Amazon rain forests, where you'll meet arachnids that look like eight-legged bowling balls and that love the taste of human flesh.

Game play is deceptively simple. You start out in the first town, represented by an overhead map. Guiding your bug-mobile with a joystick, you travel to the various houses, schools and other buildings in town, in search of the queen spider. Once you stop at a building, the screen switches to an interior view. From here you guide McClintock through the infested rooms, doing battle with spiders, and their webs, which can seriously slow you down.

A few spider bites will do you in, so you'll find first aid kits in every structure. You'll also find goodies such as aerosol cans and matches that together make great flame throwers. McClintock is armed with three basic weapons: an insecticide spray gun, bug bombs and his sturdy workboots—yes, you can also

If you thought the movie was creepy, wait until you play the game!

stomp on the little buggers (pun intended). Once you get close enough, a single shot from the spray gun is usually enough to kill a soldier spider. Some cling to the ceilings until they can jump on your head or slide down their sticky strands to nip you in the neck. Bug bombs quickly clear an entire room, but your supply is limited.

The true objective is to find the egg sack in each building. Only one house in the town hides the queen, so you may have to clear many homes and destroy numerous egg sacks before you find your quarry. Then, watch out: The Queen spider is one bad mamma-jamma!

Everything about Arachnophobia is top notch, from its crisp, three-dimensional graphics, to its superb soundtrack. I was particularly impressed with the graphics, reminiscent of those in Maniac Mansion, only cleaner and more colorful. It can get downright creepy as you guide McClintock through the rooms and up and down stairs.

While the joystick operation is fairly basic, it will take you a town or two before you become totally comfortable. Additionally, I suggest that you use a fastload cartridge, if you have one available; the game uses a double-sided disk and loading can be tedious.

I recommend this game to anyone who's looking for a "stomping" good time—unless you really suffer from arachnophobia. But, who knows, your fear of spiders may vanish . . . after a few dozen of them drop on your head!

($29.95/C-64. Walt Disney Computer Software, 500 S. Buena Vista St., Burbank, CA 91521)

SOFTWARE REPORT CARD

Fantastic!	A
Real Nice	B
Pretty Good	C
Not So Hot	D
Crummy	F

PREDATOR 2 ..... B–

Here's one game even Popeye couldn't survive

Predator 2, another Hollywood spinoff, attempts to weave the storyline from the movie into an arcade game. Does it succeed? Well, that depends on two things: One, do you have a joystick arm the size of Arnold Schwarzenegger's? Two, do you have the gobs of patience and intensity necessary to see this game through?

If you answered *no* to either question, you may want to pass on this game. But if you're a joystick junkie, Predator 2 could be a heck of a lot of fun.

You are detective Mike Harrigan, a tough, street-wise cop, whose sole mission in life is to rid the city of its drug lords. Street wars are tearing the city apart and you must quickly put an end to them. Unfortunately, there's someone else in the city with an eye on the drug kingpins and gangsters—the Predator, an alien creature who bends visible light waves to make himself virtually invisible. As in the movie, the drug war will take most of your attention, so you won't have to fight the creature right away.

Predator 2 offers four levels of play and puts a new spin on the Rogue's Gallery theme. You must quickly identify and shoot the bad guys, while avoiding ►

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hapless pedestrians. For example, the first level finds you on the city streets with a "you-are-there" perspective, and buildings smoothly scrolling by. Armed initially with a .45, you must identify and kill gang members as they emerge from doors and windows, and attack you from the street. Of course, you have to avoid killing pedestrians, police officers and bystanders, all of whom often get in your line of fire. Occasionally, ammo clips, body-armor and better weapons scroll by. Shoot them and they'll be added to your inventory. If your body-armor level falls too low, or if you wound too many pedestrians, the game ends, offering you either the chance to continue or start over. Clear a level, and you move on.

The goal is, obviously, to survive the four levels of play and confront the Predator. Whether you have the stamina or joystick prowess to do so, however, is another matter. I consider myself a joystick "contender," but I was absolutely exhausted after clearing the first level.

Predator 2 gives the Rogue's Gallery theme new meaning.

This is one of the few instances where I wish someone would come up with a Nintendo-type control pad for the C-64. Aiming the weapons involves moving a small target around the screen, and with my bat-style joystick the movement was too clumsy and imprecise to clear the bad guys from the screen fast enough. Moreover, this imprecision made it difficult to grab ammo clips and weapons. Not only did my more powerful weapons run out of ammunition very quickly, but I also missed targets who went on to shoot, bomb or otherwise molest me. Very frustrating. Pistol-grip or Atari-type joysticks might give better results.

Otherwise, Predator 2 sparkles with graphics and sound. The animation, whether you're on the street or in the slaughterhouse, is simply superb. The bad guys are big and well-drawn as they jump, tumble and run across the screen. Of course, as in most Konami games, the sound effects and soundtracks are also wonderful.

I really wanted to get to the last level and meet the Predator. Judging from the first few levels, that meeting must be excellent. So if anyone out there knows an 11-year-old with hands and nerves of

CALC II ..... B+

Calc II incorporates the best of past spreadsheets

Back in the stone age, poor Gronk had to count the number of saber-toothed hedgehogs he'd caught by separating rocks into representative piles. 74,000 years later, it took a room-sized, vacuum-bulbed monstrosity to make those computations. Now, forty years after that, you can use your Commodore computer as an electronic spreadsheet and do the work that a CPA can do, and in a fraction of the time.

There have been many spreadsheet programs for the C-64 over the past several years, each improving on its predecessor. Calc II has incorporated the best features of past spreadsheets, wrapping them all into one fast and easy-to-use package.

In its simplest terms, a spreadsheet is nothing more than a tool for tracking numbers and figures, making calculations, and asking "what if" questions about your finances. Calc II, like other spreadsheets, provides templates that run the gamut, from home mortgage and depreciation tables to future value of investments and much more.

Calc II provides you with a matrix that is 240 × 240 cells large, making it one of the roomiest C-64 spreadsheets available. Moving around the matrix is easy in Calc II, with a scrolling feature, and a Goto command that jumps to any cell in the matrix. There's even a command to set up four independent virtual windows, letting you view and edit data from four different parts of the matrix at once.

Another impressive feature of Calc II is its speed. This is not a Basic or compiled Basic program. It's pure machine language, so you won't have to wait on calculations. Obviously, the spreadsheet supports automatic and manual calculations, text and keyboard graphic displays, and offers automatic formatting. It also includes over a dozen formulas normally used in Basic language programming, such as random numbers, integers, square roots and logarithms. And special functions for working with tables and adjusting numbers can be called upon at any time.

Information within the spreadsheet may be sorted, configured and displayed with a myriad of commands. You can display information horizontally for bar charts or graphs. Likewise, it has full-featured editing capabilities for simple deleting, inserting or otherwise manipulating columns, rows and cells.

Calc II is not difficult to learn, even for the beginner. The manual leads you through the program in tutorial style. As spreadsheets go, it's extraordinarily easy-to-use; most of its functions are accessed with CONTROL key combinations. The documentation is fully indexed for easy reference.

If you're not up to creating your own templates, then you'll be pleased to find nearly 50 prepared spreadsheet templates on disk, including a check balancer, depreciation models, as well as various loan, scientific and mathematic templates.

Calc II supports output to printers, including virtual printing that automatically splits the matrix when the spreadsheet is larger than the printer. A full range of disk functions and customizing features are available, along with a utility to merge spreadsheets together.

Unfortunately, Calc II does not support the Commodore RAM expanders. I realize that the average user would do fine with the 240 × 240 matrix, but I can envision a small business requiring more room and more memory—especially when merging spreadsheets. With an REU, Calc II could virtually double the size of the matrix offered. Perhaps future releases will take this into account. I also would have liked a pop-up calculator function, and perhaps even a simulated 80-column mode.

Even without these niceties, however, Calc II is a superior package when it comes to speed and ease-of-use. It offers just about every function you'll need to manage numbers and, as I've said, you probably will never have to create your own template. So, while Calc II doesn't break new ground, it combines the best of its predecessors, making it an excellent choice for the Commodore user.

($29.95/C-64. Pankhurst Programming, Box 49135, Montreal, Quebec H1N 3T6, Canada)

—JR

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steel, put him or her on this game and let me know what it takes to get there. By then, the plaster cast on my joystick wrist should be long gone.

($19.95/C-64. Konami, 900 Deerfield Parkway, Buffalo Grove, IL 60089)

BACK TO THE FUTURE III C

Sharp graphics and sound just aren't enough

Since this Software Gallery has a Hollywood theme so far, we may as well look at one more game whose claim to fame rests on the laurels of a movie: Back to the Future III. This game is a mixture of arcade and action divided into several scenes. Unfortunately, its main attraction is its great graphics and sound, otherwise it's a senseless game with little staying power.

As with many movie games, BTF3 attempts to follow several major story lines. You'll play the parts of both Marty and Doc during different portions of the game. During the first series, it's Doc against time and warring Indians as he attempts to rescue his sweetheart from a runaway wagon. Using full-screen sideways and overhead views, you guide Doc's horse up, under and over a basic obstacle course that takes a good while to master. You won't have much time to sit around admiring the beautiful scrolling graphics; if you don't get shot off your horse or fall into a ravine, you'll be smacked by objects falling from the back of the runaway buckboard.

This Hollywood spin off is great to look at, but not much fun to play.

Successfully past the first scene, you'll progress to a shooting gallery and then to a pie-throwing melee. Clear the bad guys and you'll move on to the last scene, the train. Here you're riding atop the carriage of a speeding train and must make your way to your trusty DeLorean at the train's front.

The full-screen graphics and animation in all the levels are simply magnificent and are accompanied by a great soundtrack. But what's the point? Sure the first few moments of each level are fun, but getting dumped from a horse or being shot several dozen times becomes tedious. Mastering each level involves simply memorizing the timing needed to get through the scene. When you've been through BTF3 once, the thrill is gone.

In my opinion, Back to the Future III should go back to the drawing board.

($31.95/C-64. Konami, 900 Deerfield Parkway, Buffalo Grove, IL 60089) ■

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CURTAIN CALL

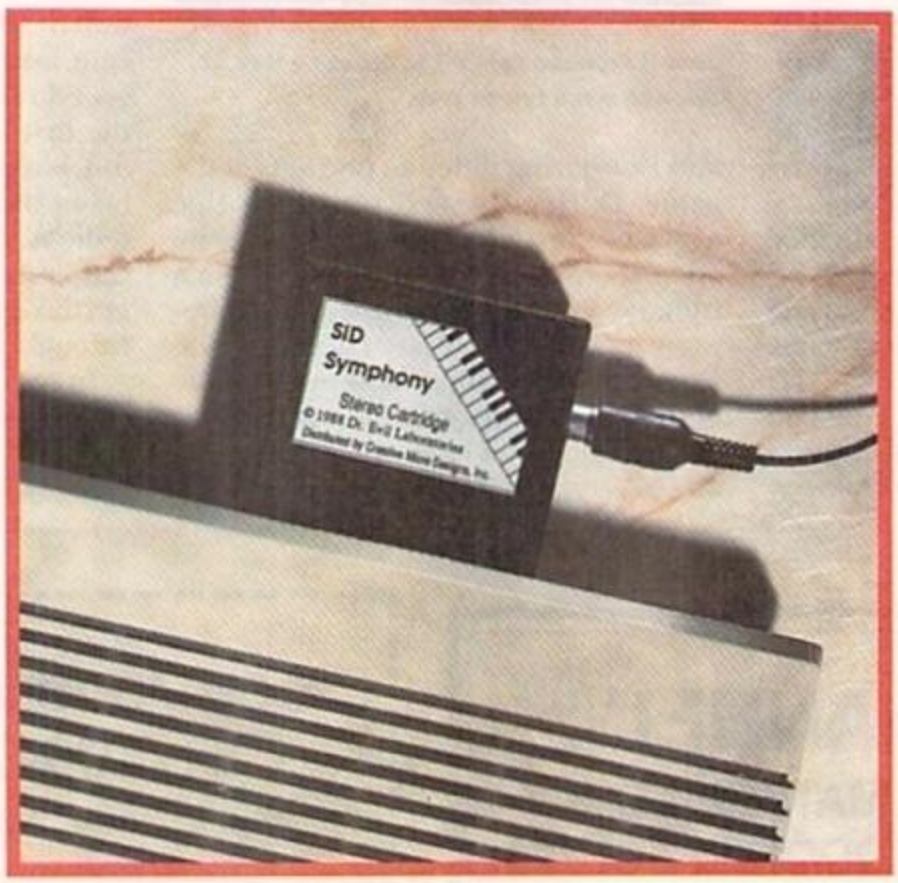
***RUN*'s column where worthy products step into the spotlight and take a bow.**

SID Symphony Stereo Cartridge

Ah, the joys of multi-voiced stereo sound. As the owner of both an Amiga and a sound-enhanced IBM, I've become a computer music snob. It's a pleasure that only owners of 16-bit computers can know.

Wanna bet? I am amazed how the C-64 keeps plugging along, proving over and over that there is indeed a lot of life left in this venerable little computer.

To prove the point: I give you the SID Symphony Stereo Cartridge.



Pump up the volume with the SID Symphony Stereo Cartridge. It boosts Commodore audio to six channels of stereo sound.

This apparently innocuous black box puts C-64 music and sound in a league with the big boys. How? It adds a Sound Interface Device (SID) chip to the one already in the computer, giving you two SID chips that together command six voices in stereo. The cartridge provides three voices for the right channel, while the computer's own SID provides three voices for the left channel.

To enjoy the stereo sound, you'll have to route the cartridge's output (right channel) and the computer's output (left channel) into a stereo or an amplifier. Getting from the cartridge to the amplifier is simple: Just plug one end of an RCA male-to-male audio cable into the cartridge's RCA jack, and the other end into the amplifier's auxiliary input.

Getting sound from the computer to the stereo can vary, depending on which monitor you own. If you have a 1902A or a 1084 monitor, simply plug the audio cable into the monitor's Audio In jack and the amplifier's auxiliary input. (Audio In? I know, it sounds backwards, but it does work.)

If you have the 1084S, you have the advantage of built-in stereo. Connect one cable from the computer's Right audio jack to the amplifier's auxiliary input. To use stereo for both the cartridge and the computer, you'll need two Y-splitters and two more male-to-male cables. The setup is not complex, and the documentation leads you through it in just a paragraph or two. (Don't worry—you won't have to solder anything.)

So how does it sound? Quite simply—amazing. You'd be surprised exactly what three more voices can do for the C-64. You'll also receive a disk that contains a large collection of music that has been "SIDded" especially for the cartridge, plus the public domain program Stereo SID Player. With SID Player up and running, selecting and playing stereo songs becomes a simple matter of hitting a function key.

I've got to admit that the songs included on the demo disk are about the best I've ever heard on a C-64. You'll find such titles as *AxelF* from Beverly Hills Cop and Bach's *Two Part Invention #13*, both marvelous arrangements. *Johnny B. Goode*, with its funky, sliding beat, nearly puts any Amiga or IBM arrangement to shame. Likewise, *Dueling Banjos* is a true marvel.

If you belong to the QuantumLink or GEnie online networks, you have access to literally hundreds of songs written for this stereo cartridge. In fact, CMD has its own Q-Link area featuring hints, advice and ordering information. Moreover, Q-Link's music room stocks nearly any kind of SID music you could want.

If you want to compose your own music, then you need two other programs: Stereo Editor and Enhanced SID Player, both available from CMD. With these programs, even a novice composer can craft SID melodies, or "SID-ify" a favorite tune from sheet music.

The cartridge also supports MIDI, though with limitations. So if you plan to use the stereo cartridge with a Commodore-compatible MIDI interface, call CMD and request additional information.

I don't normally get too excited about computer music, but SID Symphony is perhaps the most innovative and useful cartridge ever developed for C-64 music. Back in 1982 the C-64 was hailed as a technological breakthrough in the area of computer sound. As the years passed, however, the 64's three voices just could not compete with the newer, more powerful machines. Now, with the SID Symphony Stereo cartridge available, the competition's back. ■

—John Ryan

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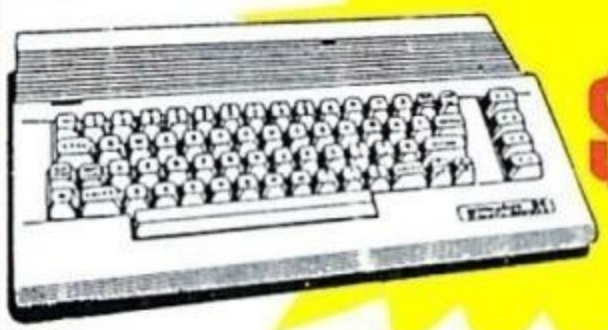

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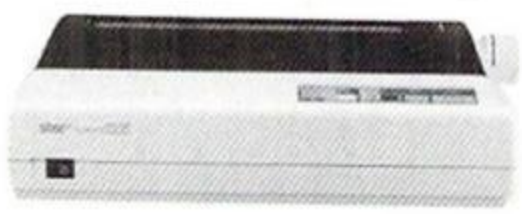

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